devatec

User manual

ELECTROVAP® RTH

Resistive steam humidifier

from 3 to 17 kg/h

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Pictures for illustrative purposes only

DIRECTIVES CE APPLIED

Electromagnetic Compatibility Directive :	**89/336/EEC, 2004/108/EC**
Low Voltage Directive :	**73/23/EEC, 2006/95/EC**
« Machinery » Directive:	**98/37/EC, 2006/42/CE**

The humidifier complies with :

EN 61000-6-3: Electromagnetic compatibility generic requirements (residential, commercial and light industries)

- EN 55022 class B; conducted and radiated emission limits

EN 61000-6-2: Electromagnetic compatibility (EMC) - Generic standards—Immunity for industrial environments;

- EN 61000-4-3: Radiated, radio frequency, electromagnetic field immunity test
- EN 61000-4-6: Immunity to conducted distrubances induced by radio frenquency fields
- EN 61000-4-4: Electrical fast transient/burnt immunity test
- EN 61000-4-5: Surge immunity test
- EN 61000-4-2: Electrostatic discharge immunity test.

EN 60335-1: Low voltage : safety of electrodomestical devices and similar

EN 60335-2-88: Low voltage : safety of electrodomestical devices and similar, concerning humidifiers

EN 60204-1: Safety of machinery—Electrical Equipment of machines—Part 1 : General requirements

Manufacturer's name & address

devatec SAS
87 Rue Feu Saint Eloi
76550 Ambrumesnil - FRANCE

Type of equipment

Steam humidifier

Model name & series

ELECTROVAP RTH-LC

Year of manufacturing

2007

We the undersigned, hereby declare that the equipment specified above complies with the above-mentioned Directive(s) and Standard(s).

Name : FRAMBOT Jean-François
Position : General Manager
Date : 05.06.2008
Signature:

Pictures for illustrative purposes only

IMPORTANT

Please read, heed and follow the enclosed safety information and the warning labels inside the humidifier before installation or maintenance.

Warnings & safety symbols

Warning : This symbol is used to designate a danger of injury or potential damage to the system.

Caution : High voltages are present inside the humidifier. All works concerned with the electrical installation must be carried out by skilled and qualified personnel.

Caution : Danger of scalding ! The ElectroVap RTH generates steam during operation and therefore surfaces and pipe-work become very hot. Ensure that equipment not sustaining high temperatures be kept away.

Warning : the end user should ensure that the equipment be disposed of according to the local prevailing regulations.

Delivery and storage

Any loss or damage during delivery should be reported to carrier by registered letter within 3 working days and be advised to **devatec** or to authorized dealer.

It is recommended that the ElectroVap RTH-LC humidifier be kept in its transit packaging for as long as possible prior to maintenance. If the humidifier is to be put into storage prior to installation, it must be stored under cover and protected from physical damage, dust, frost, rain and humidity. More than 6 months storage is not recommended.

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IMPORTANT

This section should be read carefully to ensure safe and correct installation of your humidifier.

GENERAL

This manual contains all details necessary for the planning and installation of the ElectroVap RTH humidifier. In addition commissioning and maintenance details are included.

The manual is intended for use by engineers and properly trained technical personnel. Maintenance, servicing or repair work must only be carried out by suitable skilled and qualified personnel, the customer must be responsible for ensuring their suitability.

Any risks or hazards, especially when working from ladders or towers should be identified by a skilled and Health and Safety representative and effective control measure put in place.
No liability will attach to the Distributor if any damage, injury or accident is attributable to inattentive, inappropriate, negligent or incorrect operation of the machinery whether or not caused deliberately. Always isolate all electrical and water supplies before commencing any maintenance.

Every effort has been made to ensure details contained in this manual are correct, however, in view of the wide range of conditions experienced in air handling systems, the information provided should only be used as a guide. Please contact your Agent if any doubt.

Correct use

ElectroVap RTH-LC humidifiers are ONLY intended for use with air handling systems or direct air humidification. ANY OTHER APPLICATION IS NOT CONSIDERED USE FOR THE INTENDED PURPOSE. THE MANUFACTURER CANNOT BE MADE LIABLE FOR ANY DAMAGE RESULTING FROM INCORRECT USE.

Water

ElectroVap RTH humidifiers are designed to be used with mains, demineralized R/O with a minimum conductivity of 30 µs or softened water. On no account attempt to introduce any other fluid or chemical into the system. Water supply should not exceed 6.0 bar and installation should comply with local regulations.

Electricity

All work concerned with electrical installation MUST only be performed by skilled and qualified technical personnel (eg electrician or technicians with appropriate training). The customer MUST be responsible for ensuring their suitability.

It is the duty of the installer to ensure that suitable sized cables and MCB protection is provided. Please observe the local regulations concerning the provision of electrical installations.

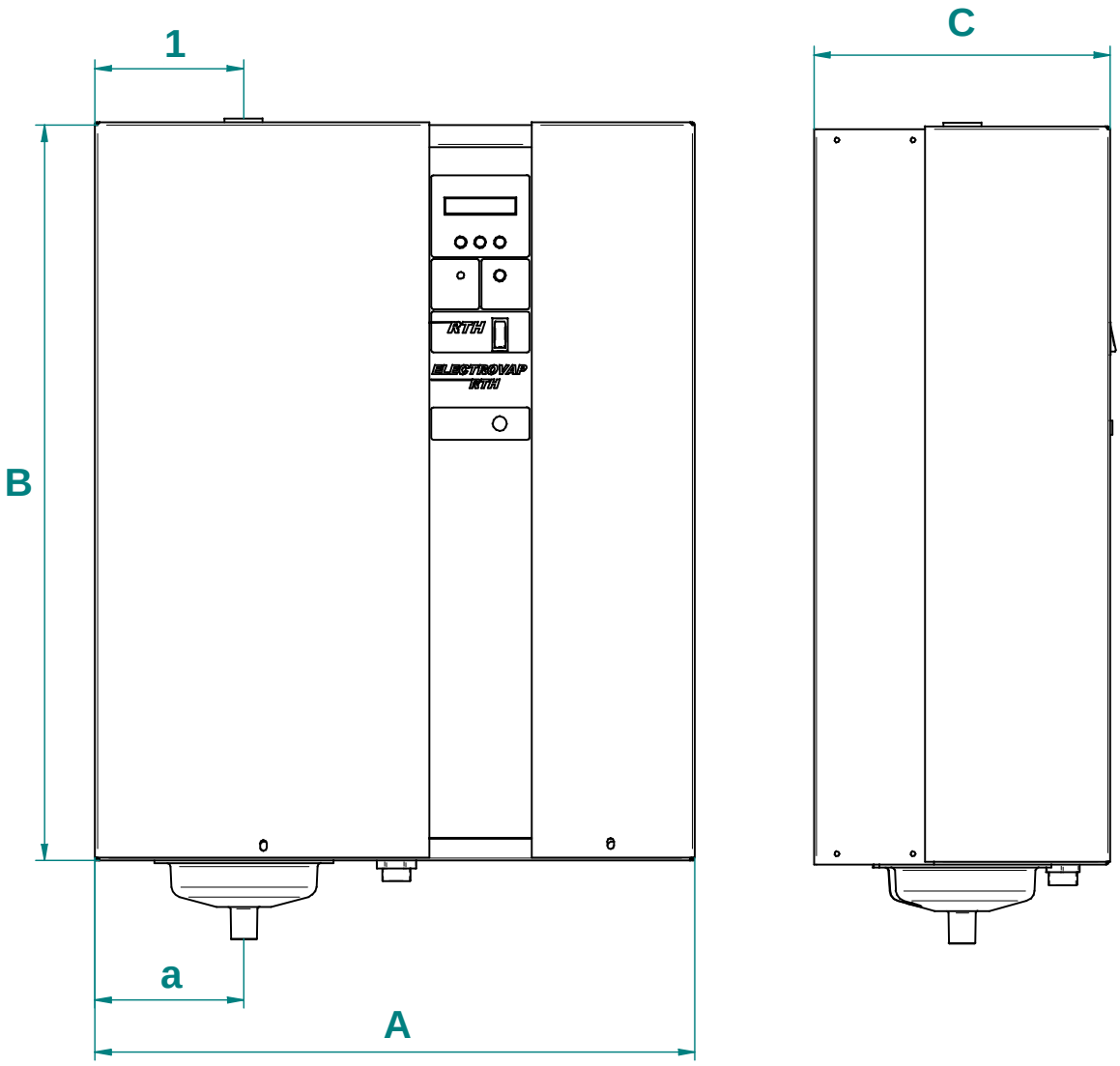
Warranty

A two year warranty term—cost and labor—is applicable to the parts of the ElectroVap RTH to the exception of the consumable parts (valves, cylinders or parts of cylinders) provided our recommendations of use & maintenance have been adhered to. Failure to specify and fit original parts and accessories will invalidate our warranty.

NOTE

The manufacturer's policy is one of continuous research and development. He therefore reserves the right to amend without notice the specifications given in this document.

RTH 3 to 15



Overall dimensions (mm)		Steam outlet (mm)		Drain outlet (mm)		Weight empty (kg)	In operation (kg)
A	550	1	140	a	140	25	35
B	680						
C	272						

Pictures for illustrative purposes only

TAKE CARE :

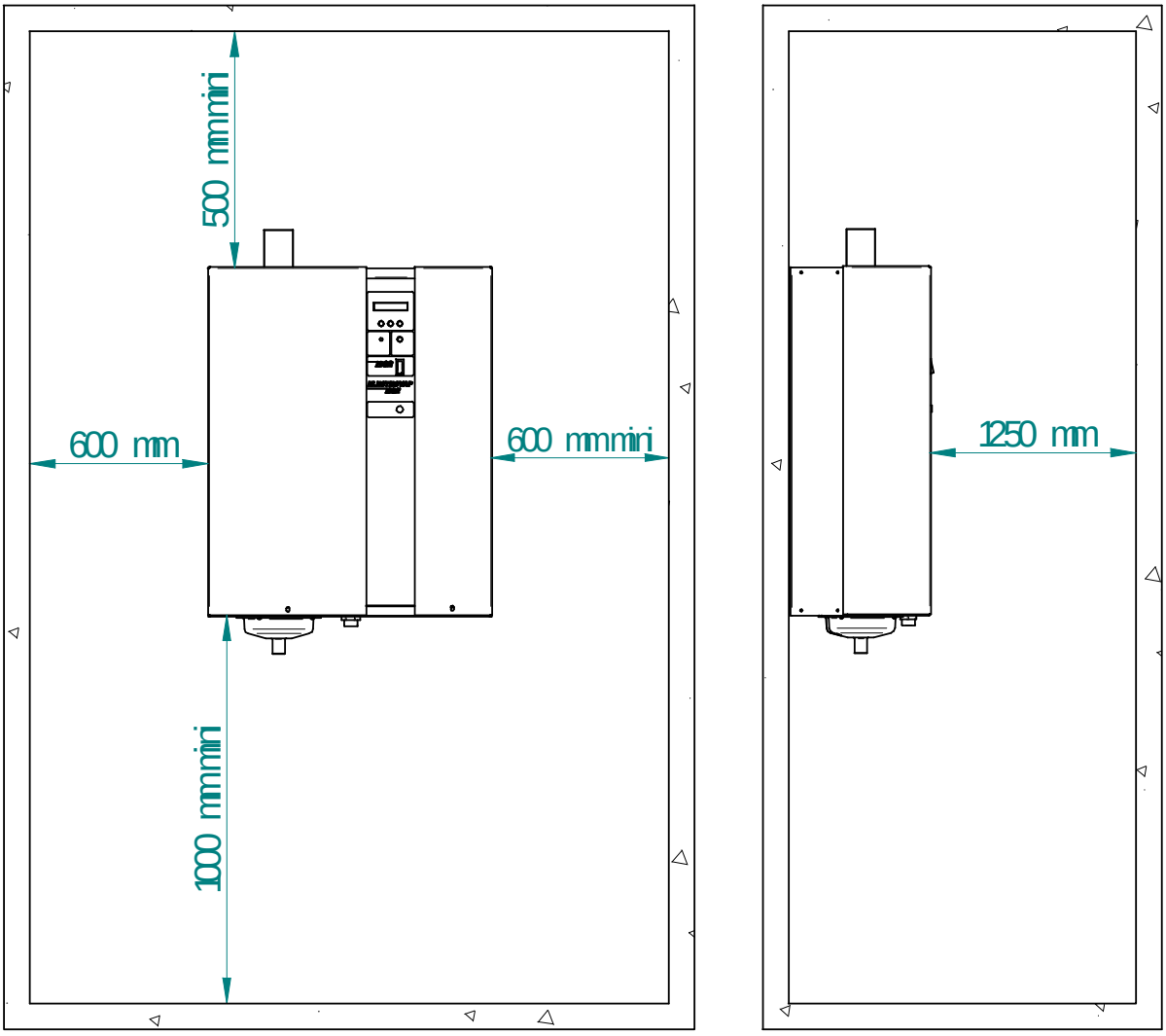
The humidifier should be installed in a room the temperature of which must be between 5°C and 40°C that the humidity level should not exceed 80 %.

The rear part of the RTH-LC becomes hot during operation (about 60°C). Make sure that the surface on which the humidifier is installed can sustain hot temperatures.

The devatec steam humidifiers are designed to be installed on wall. Make sure that the surface the humidifer is hanged on is strong enough.

Install the humidifier at the shortest distance of the steam pipe (s.a. page 10) whenever possible for best performance.

Arrange position of the humidifier on wall to provide free access for easy maintenance (see after installation drawings here under).



Pictures for illustrative purposes only

NOTA BENE :

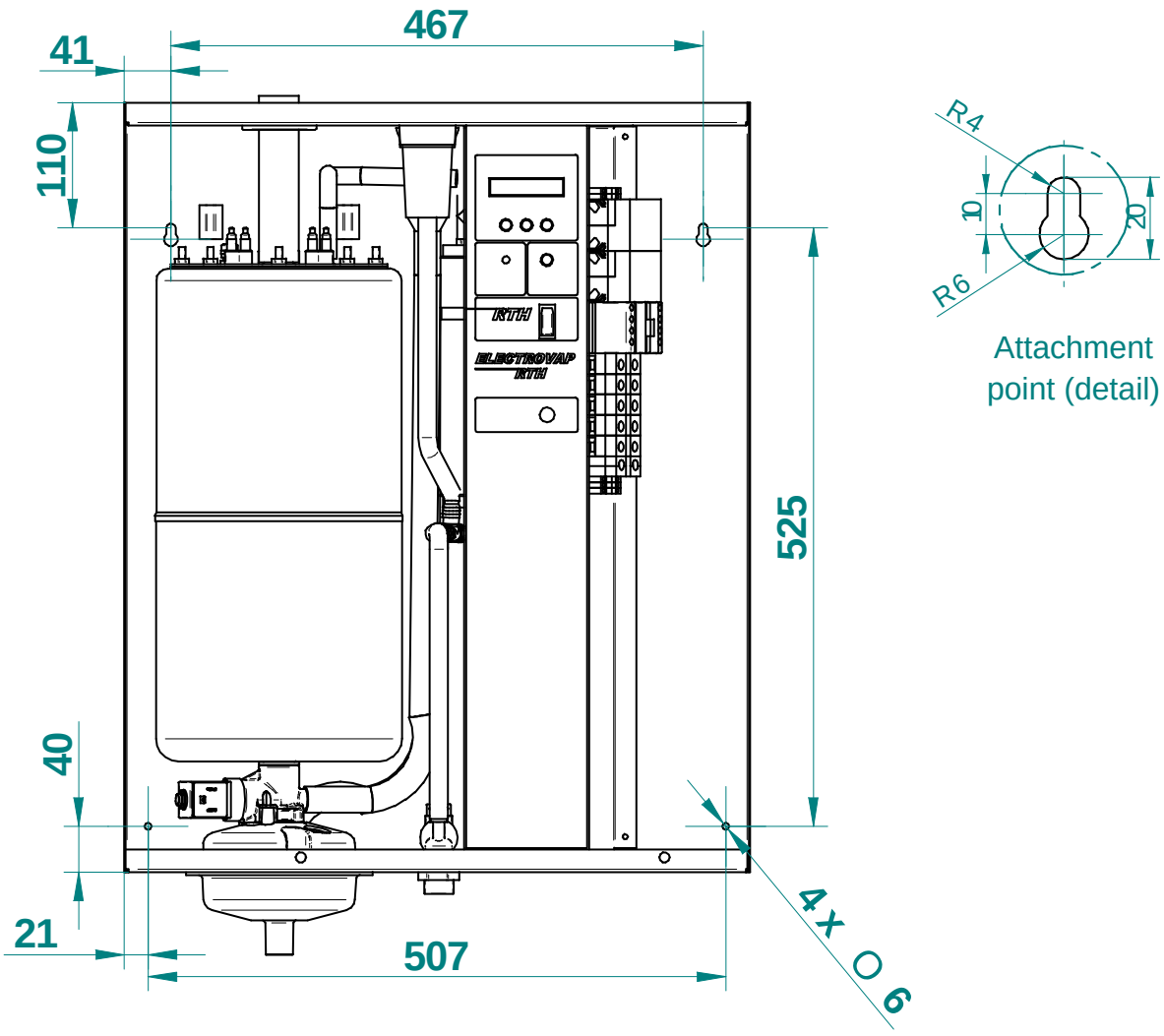
Use attachment equipment appropriate to the support.

Installation procedure :

Mark the 4 mounting holes and drill.

Insert pegs. Screw the upper screws allowing (diam 6mm) allowing about 10 mm for hanging the cabinet.

Hang the cabinet and screw the lower screws. Tighten up all the screws for securing the installation while ensuring that the cabinet is level.



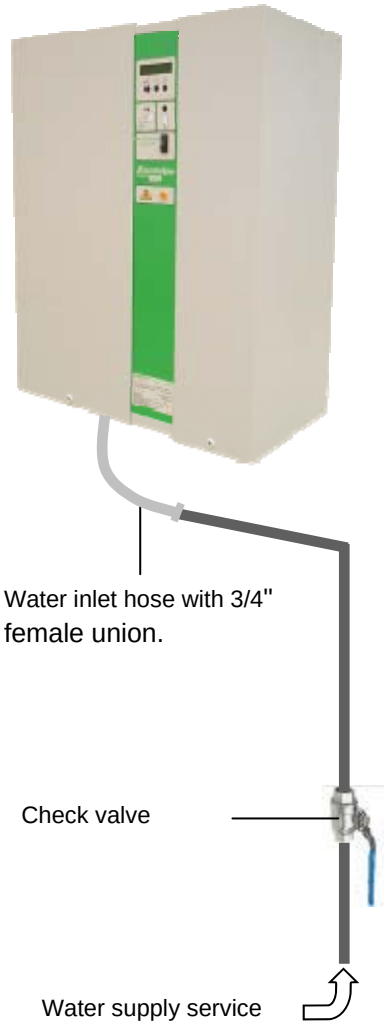
Pictures for illustrative purposes only

A fresh mains cold water service should be used to supply the unit. The water pressure should be between 1 & 6 bars & should not exceed 40°C in temperature.

The water supply connection is under the bottom of the unit. The humidifier is delivered with a water inlet hose of 50 cm long with a 3/4" female fitting to the cold water supply. A direct copper connection is **PROHIBITED**.

A check valve should be located on the mains and cold water service connection to the unit.

The inlet valve base has a basket filter (s.a. page 34).



The RTH humidifier uses water to produce steam so leakage may happen causing potential damage. If an installation in false ceiling or above prime rooms (such as museum, exhibition or laboratory rooms) is considered, ensure that the floor below the humidifier is constructed from waterproof materials (with draining facilities) to withstand any water spilling during servicing or if a problem occurs.

Information about the water quality : chloride concentration : < 75mg/l, phosphate concentration : < 5mg/l, chlorine consentration (3 to 6° dA) : < 100mg/l, poor concentration inCO_2, organic elements in poor concentration.

The RTH humidifier can run with the following water qualities :

- Tap or raw water : water TH between 5° and 40° French grade.
- Demineralized water : **<u>30µS minimum</u>** (caution : the demineralized water is corrosive; use appropriate piping material : inox, PVC)

- **Softnened waters (not recommanded)**

The cation exchangers (softeners) do not suit for the water supply as they do not bring down the mineral salt content disolved in the water, the polyphosphate measuring devices as well.

A water softener consists basically in replacing a calcium ion by a sodium ion the solubility capability of which is about 7 times higher. So a water softener does not affect the quantity of mineral salts contained in the water but alters their nature.

An excess of sodium chloride may generate foam which disturbs greatly the correct running of the humidifier. It is essential that a duplex softener be used.

A small volume of tap water **must** be added to the softener water to get a **<u>TH value of 10° minimum</u> (however a TH value of 12° is highly recommended).** A water analysis should be made to determine the sodium chloride content.

We would not recommend the use of cation exchangers as this increases functionning costs significantly.

Pictures for illustrative purposes only

1. Use preferably hose from our supply

   NB : when brand new hoses are installed, a smell of burning may be smelt during the first running of the steam humidifier. This is normal and will eventually dispel.

2. Number of steam outlets :

   RTH-LC 3 to 15 = 1 x Ø 25 mm

3. The RTH-LC humidifier can be used with pressure ducts (P) having the following characteristics :

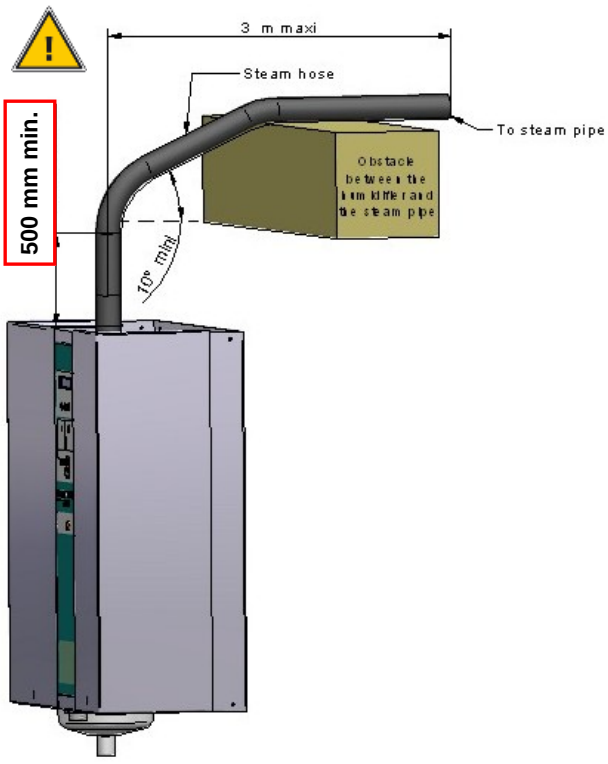
   - If P is inferior to 150 mm CE (Water column) i.e. 1470 Pa.
   - If P is between 150 mm CE and 300 mm CE (2941 Pa.) , our optional filling cup plateform must be used.

4. Please adhere to the recommendations given underneath for the installation of the steam hose according to one of the shown examples, the most suited to your installation. A set of hose clamps is supplied for ensuring a correct installation.

The humidifier should be located within 3 m. of the steam distribution pipe. If the distance is superior to 3 m. insulated steel or copper pipe of a slightly larger diameter must be used. It should not exceed 6 m.

TAKE CARE : The steam hose must be kept as tight as possible. If it happens to be pinched or kinked, this can cause the heating elements to overheat and to be destroyed due to an incorrect detection of a too low water level inside the cylinder.

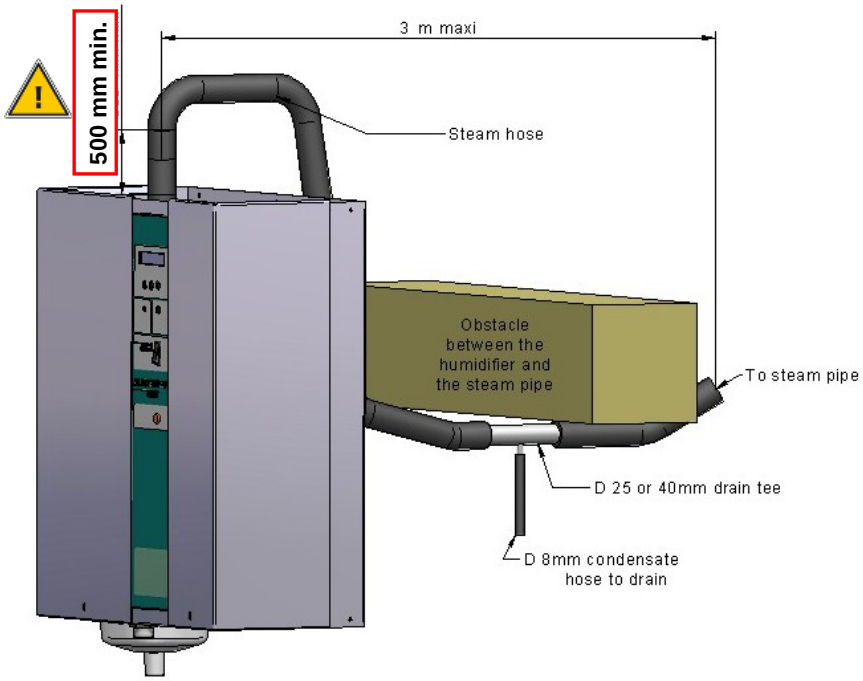
Example a



Radius of bend for steam hose :

- Ø 25mm steam hose = 250mm minimal radius

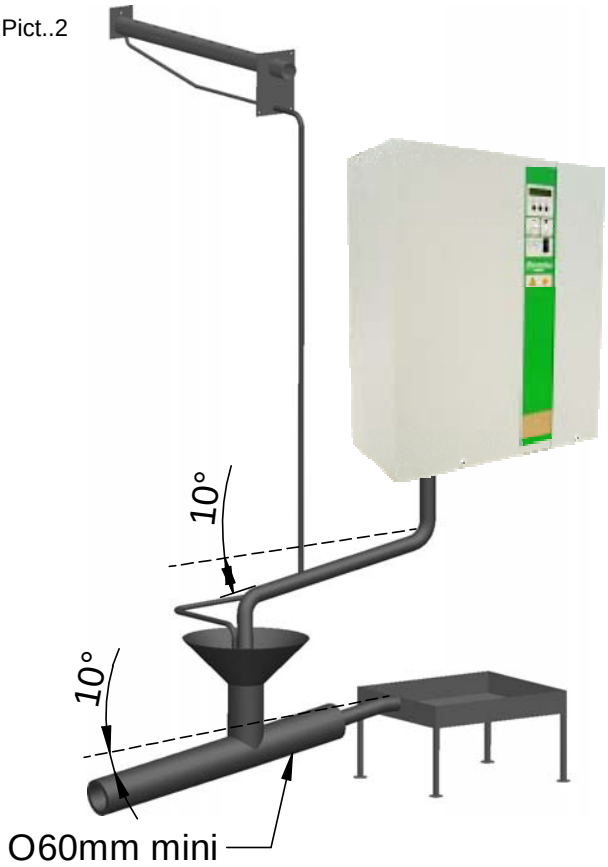
Example b


500 mm min.
3 m maxi
Steam hose
Obstacle between the humidifier and the steam pipe
To steam pipe
D 25 or 40mm drain tee
D 8mm condensate hose to drain

Pictures for illustrative purposes

Pciture.1

Pict..2



The following drawings show the water draining connections that should be made.

1. The **devatec** supplied steam hose should be used :

   RTH-LC 3 to 15 : 1 m Ø 25 mm hose with 1 hose clamp (supplied).

   This hose is designed to be connected to the draining system. Regular replacement is recommended.

2. If rigid piping is used, it must be heat (100°C) and pressure resistant PVC material and have a 100 mm wide diameter.

3. The discharge hose must be free from any obstacle. It is recommended that each humidifier has its own drain pipe and tank arrangement in case a number of humidifiers is installed.

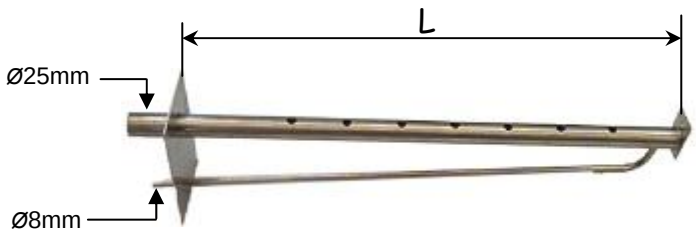
4. Use water tanks with a lid that has water collecting facilities (option on request) (s.a. drawing 1).

5. A funnel can also be used (s.a. pict. 2), but it should be offset from the underside of the unit to prevent any steam and/or condensation from getting into the cabinet. The installation of a siphon (as per the draining hose) is recommended and arrangements for holding water spilling should also be made.

6. **CAUTION :** keep a minimum pitch of 10° for both the draining & overflow hoses of the humidifier and for general drain pipe (s.a. pictures 1 and 2).

Pictures for illustrative purposes

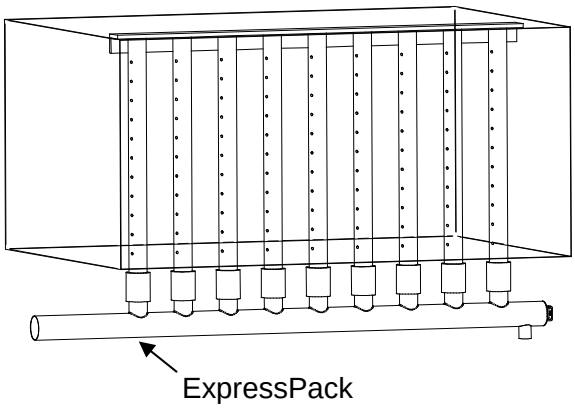
Steam distribution pipe



The steam from the boiler enters the duct or an air handling unit via a steam distribution pipe.

In order to obtain the optimum performance of the humidifier, select the longest pipe.

ExpressPack



ExpressPack

The Armstrong ExpressPack is a bespoke steam humidification system made to suit your configuration and ready to install in a ventilation duct.

It permits to have vapor trails (absorbing distances) as short as 600 mm. For further reference, please contact **devatec** or their authorized agent.

Steam distribution selection table

Steam distribution pipe for RTH-LC 3 to 15	L
	mm
D25 -L290	290
D25-L590	590
D25-L790	790
D25-L1000	1000
D25-L1250	1250
D25-L1500	1500

Pictures for illustrative purposes

Evaporation distance or vapor trail « D »

A certain length is required so that the steam coming out of the steam distribution pipe be absorbed by the air. All along this length, descrided as the evaporation distance, the steam can still be seen in the airflow as a mist which can condensate in water against any obstacle if placed within. To prevent condensation, this evaporation distance should be calculated before positioning the steam distribution pipe.

How to calculate the evaporation distance « D » (FAST METHOD)

In order to determine the evaporation distance, the attached calculation table can be used :

	% RH1 inlet air							
	5	10	20	30	40	50	60	70
% HR2 outlet air	Minimum humidification distance « D » in m.							
40	0,9	0,8	0,7	0,5	-	-	-	-
50	1,1	1	0,9	0,8	0,5	-	-	-
60	1,4	1,3	1,2	1	0,8	0,5	-	-
70	1,8	1,7	1,5	1,4	1,2	1	0,7	-
80	2,3	2,2	2,1	1,9	1,7	1,5	1,2	0,8
90	3,5	3,4	3,2	2,9	2,7	2,4	2,1	1,7

Nota bene : this calculation table is to be used for temperatures between 10°C and 25°C.

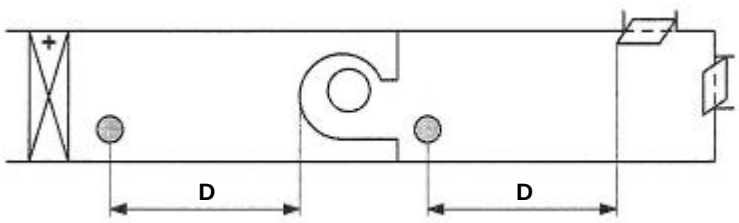
HR1 = relative humidity of air before humidification in %.

HR2 = relative humidity of air after humidification in %.

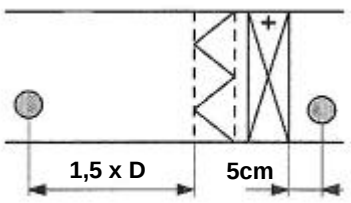
Minimal humidification distance

The steam distribution pipes must be positioned after the minimum humidification distance calculated with the help of the above table.

Before / after fan



before / after heater/filter

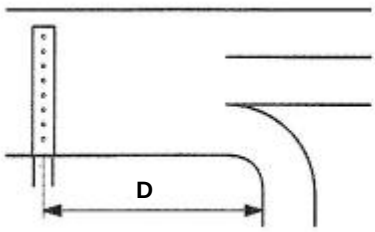


2,5 x D before thin particule filter

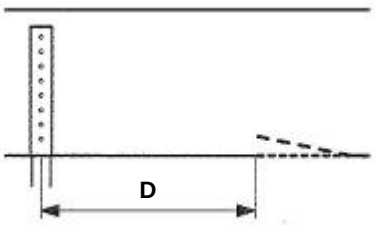
Pictures for illustrative purposes

(continued)

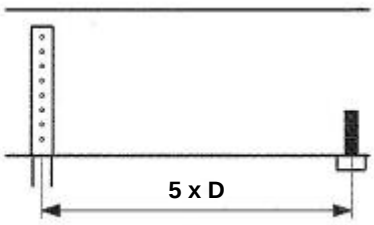
Before a junction



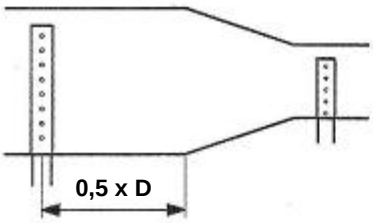
before an air opening



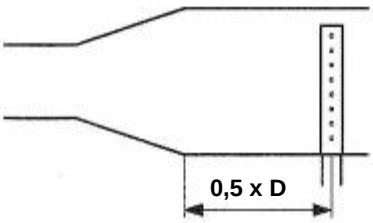
before a humidity



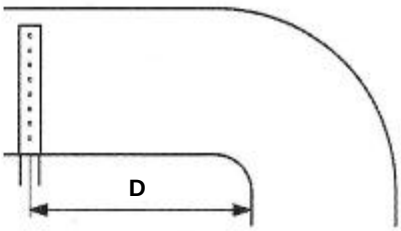
Before / after a constriction



before an expansion



before a bend



A high humidity limit humidistat must be installed in the duct to stop the humidifier in case the level of humidity exceeds the preset value.

In case the recommended distances cannot be met, please contact **devatec** or their authorized agent for an alternative solution.

If accurate values cannot be reached, a distance of 2 m. should be considered as a minimum distance between pipes & obstruction and 3 / 4 m. before sensor or humidistat.

Pictures for illustrative purposes

Please meet the following dimensions and spaces according to your configuration. For further information, please contact **devatec** or their authorized agent.

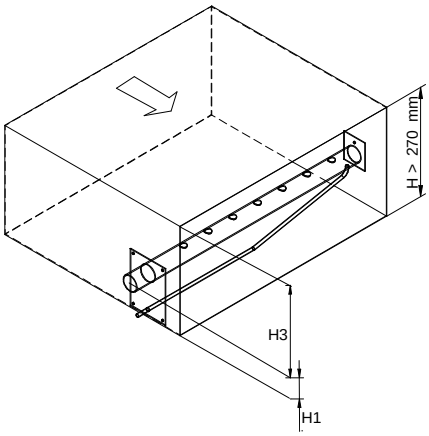
H1 = 110mm = Minimum height between the duct floor and the axle of the steam pipe.

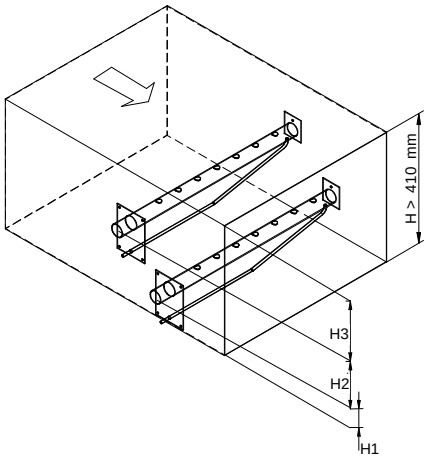
H2 = 140mm = Minimum distance between two pipes.

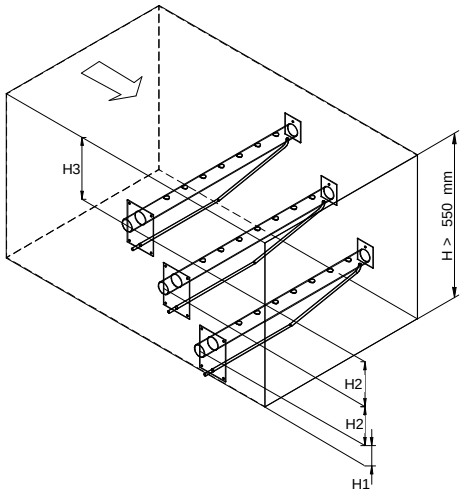
H3 = 160mm = Minimum height between the duct top and the axle of the steam pipe.

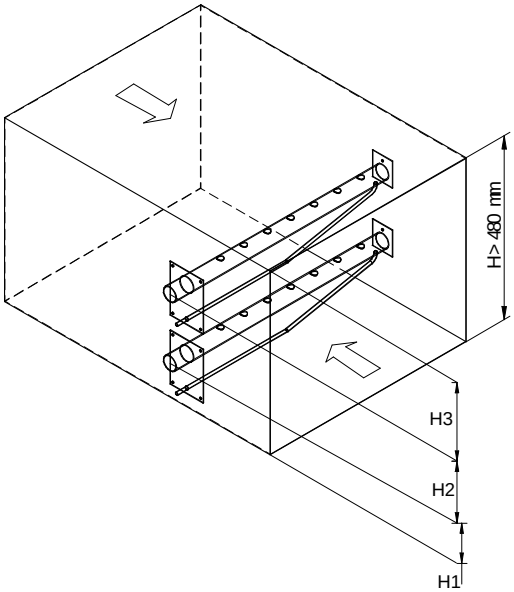
The H3 distance can be 80 mm at the shortest in case the steam pipe is installed at an angle of 30°.

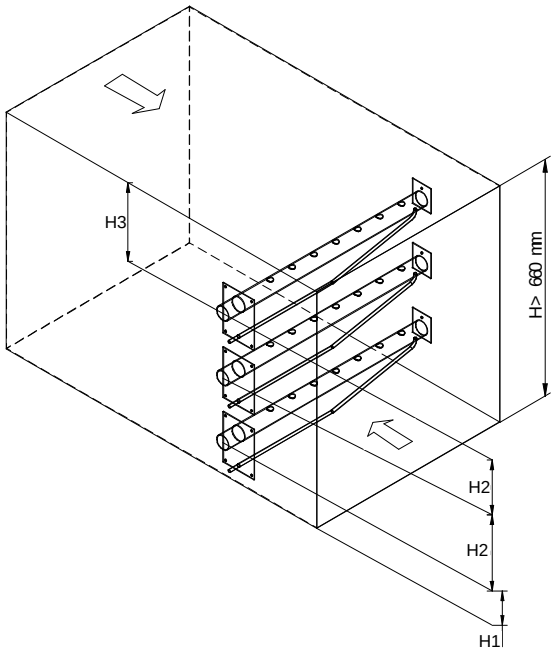
The arrow shows the direction of the air flow.











Pictures for illustrative purposes

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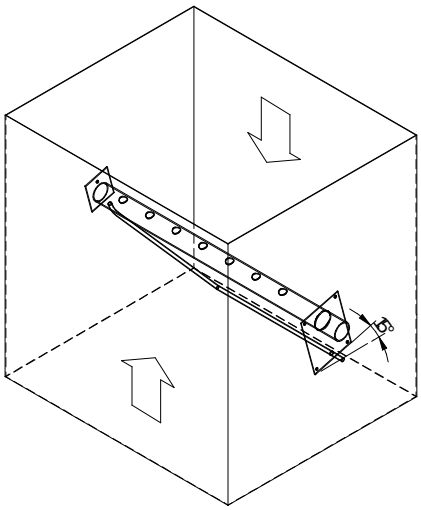
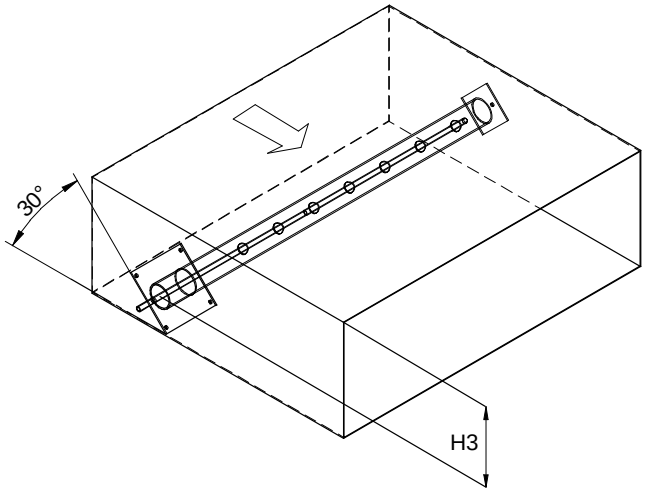
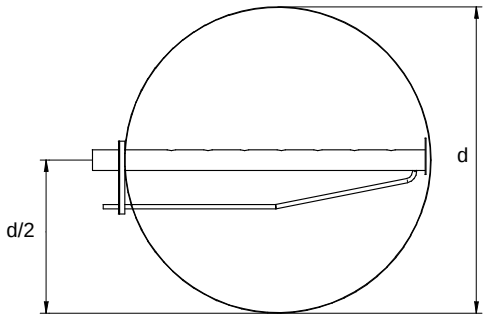


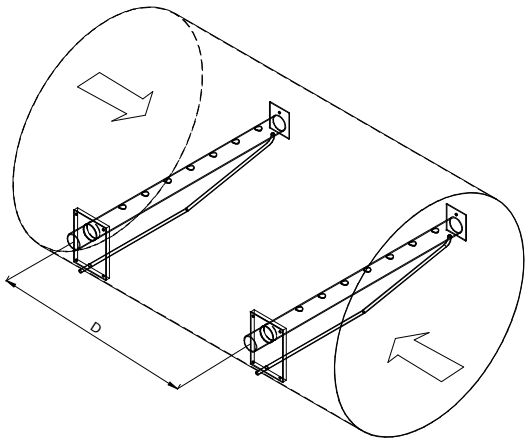
In vertical ducts where the air flow is upward or downward, the steam distribution pipe(s) must be tilted by 15° sideways.



In duct with limited height, the distribution pipe(s) can be tilted by 30° to get the 80 mm minimum height.



d = Duct diameter

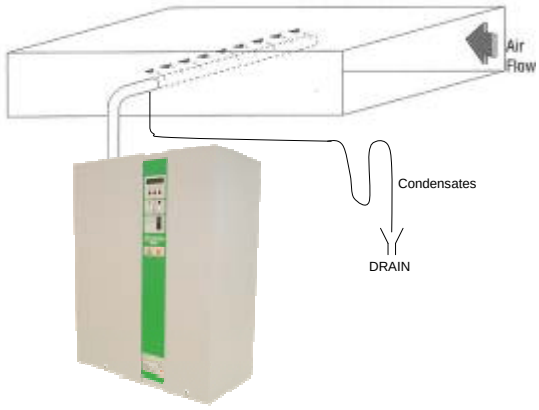


D = Humidification distance

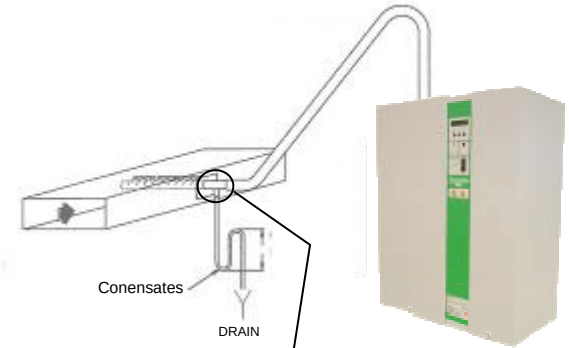
Pictures for illustrative purposes

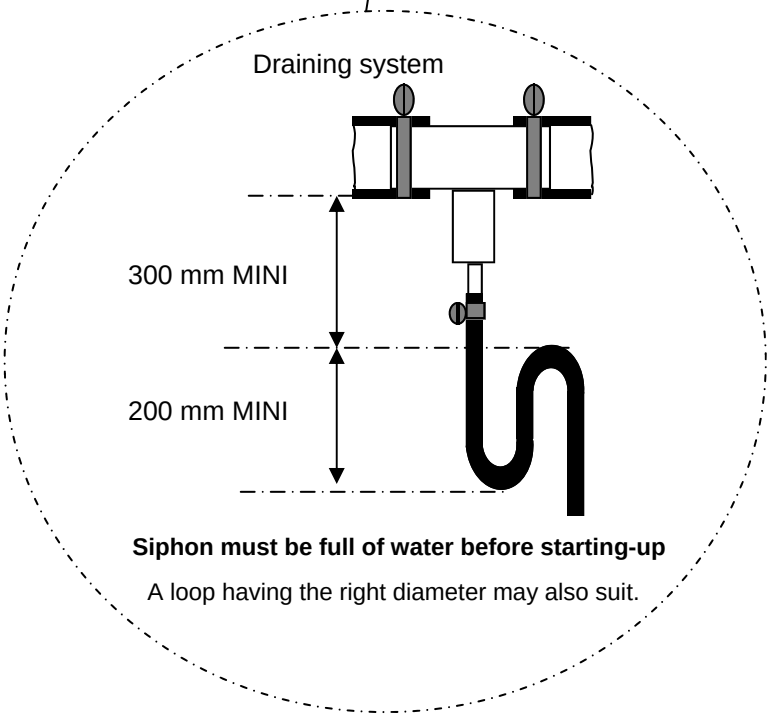
(continued)

Steam pipe above humidifier RTH-LC 3 to 15



Steam pipe under humidifier RTH-LC 3 to 15

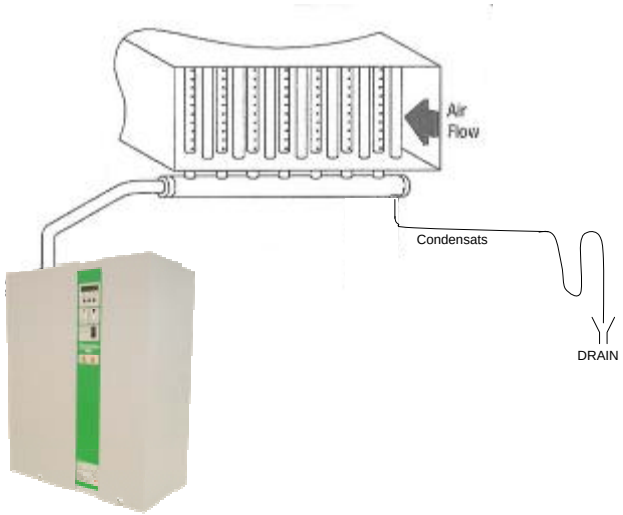




Siphon must be full of water before starting-up

A loop having the right diameter may also suit.

ExpressPack duct insersion RTH-LC 3 to 15



Pictures for illustrative purposes

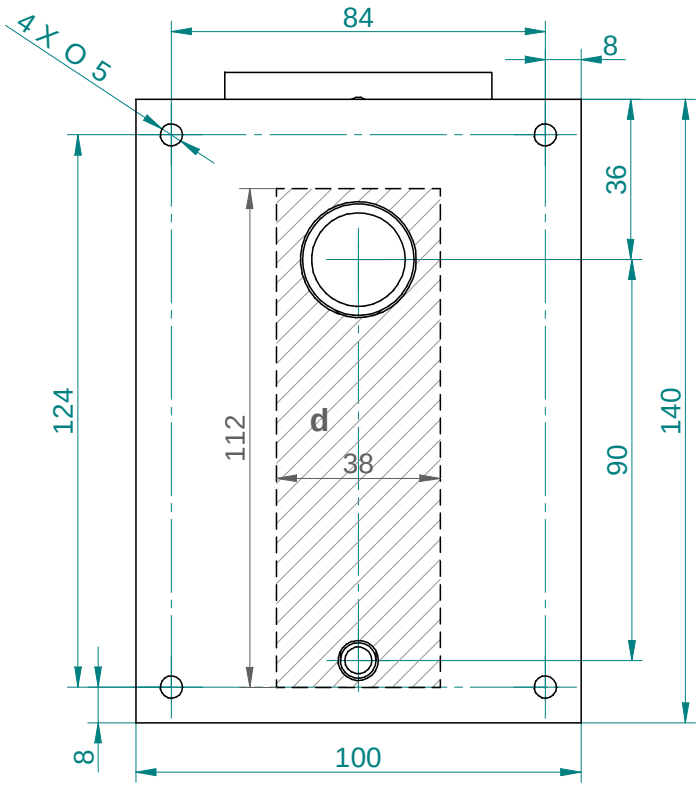
For ensuring the best steam distribution possible, we would recommend to install the steam pipes as per the two methods described underneath.

How to install in a duct

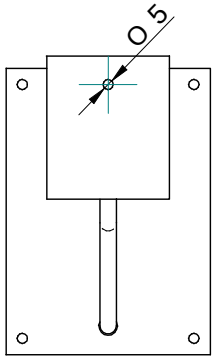
Your steam pipes must be screwed onto the ventilation duct by the fixing plate with a set of 4 bolts and nuts of Ø 5 mm. For ensuring airtightness, apply a large silicon film all around the duct installation plate.

The length of the bolts will be according to the thickness of the ventilation duct.

Steam pipe Ø 25mm



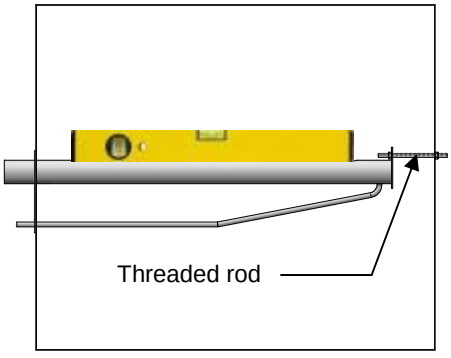
How to attach the pipe (inside the duct)



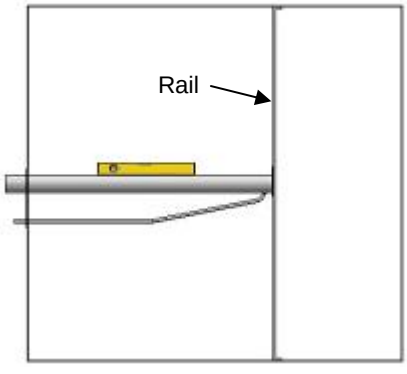
The end of the steam pipe should be attached to the duct with a threaded rod of Ø 5 mm going from the dedicated hole of the fixing plate to the outside of the duct and attached by a couple of nuts (method 1). A rail attached to the inner side of the duct can also be used - a 5mm bolt and nut are used to settle the pipe on the rail (method 2).

The steam pipe must be at level with the duct.

Method 1



Method 2



Pictures for illustrative purposes

BLOWER PACK

The Blower Pack BP1 permits the use of the humidifier in direct in-space applications where there is no ductworks.

The Blower Pack BP1 provides an output of 15kg/h.

The direct steam connection to the humidifier is ensured by a Ø 25 mm steam hose.

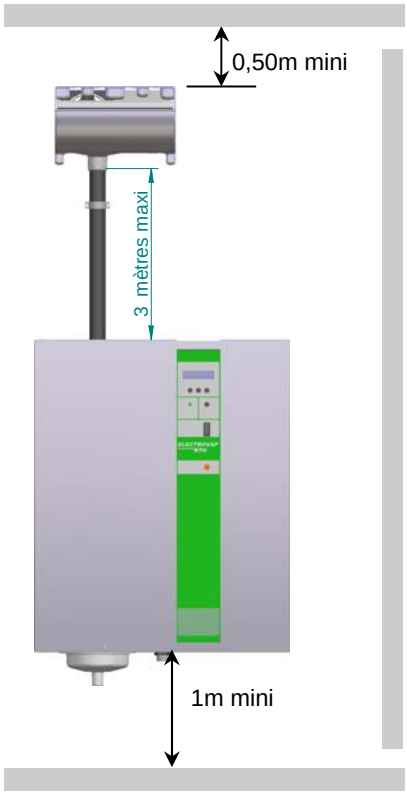
The Blower Pack BP1 is energized by connecting it to terminals 3 & 4 of the humidifier.

Allow a 3 m. distance ahead to the BP1 for a free diffusion of the steam.

Blower Pack BP1

For use and installation of the Blower Pack ventilation unit, please refer to the Blower Pack technical manual available in English.

Examples of installation



Dimensions & characteristics

	Width	Heigth	Depth	Weight Kg	dB	Max. output Kg/h	m3/h	Steam connection Ø
BP1	260mm	170mm	285mm	2	40	15	160	Ø 25 mm

Pictures for illustrative purposes

Recommandations:

All works concerned with the electrical installation must be carried out by skilled and qualified personnel (eg electrician with appropriate training). The customer is responsible for ensuring their suitability. Please observe local regulations concerning the provision of electrical installations.

Check all electrical terminal screws at commissioning, after 50 hours operation and at every service thereafter.

Take care : the RTH-LC electronic components are very sensitive to electrostatic shocks. Appropriate steps must be taken before any operation.

Pictures for illustrative purposes

RTH-LC steam humidifier in 1 x 230V - 50/60Hz

RTH	Steam production (kg/h)	Voltage (V)	Nb of phase(s)	Amperage (A)	Power (KW)	Nb of boiler(s)	Nb of heating element(s)	Power of heating element (KW)
3	2,5	230	1	1,9	8,3	1	1	1,9 (230V)
5	6	230	1	4	19	1	1	4,3 (230V)

RTH-LC steam humidifier in 3 x 400V - 50/60Hz

RTH	Steam production (kg/h)	Voltage (V)	Nb of phase(s)	Amperage (A)	Power (KW)	Nb of boiler(s)	Nb of heating element(s)	Power of heating element (KW)
5/3	5	400	3	4	6	1	3	1,9 (277V)
7	8	400	3	6	8	1	3	1,9 (230V)
10	12	400	3	9	13	1	3	4,3 (277V)
15	17	400	3	13	19	1	3	4,3 (230V)

Beware ! Before connecting power, make sure that the electrical installation has been made according to the above-mentioned values.

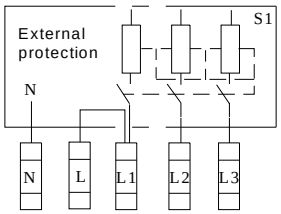
Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

External protection

In the electrical installation, an all pole switch with a minimum contact width of 3 mm must be provided

A) 3 phases + neutral
(3 x 400 V + N)

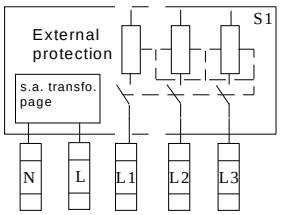


S1: triphase switch with automatic opening by striker fuses

Compulsory protection on three phases and command circuits

B) 3 phases without neutral
(3 x 400 V)

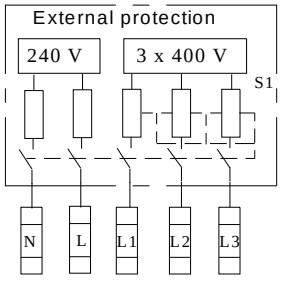
A transformer must be installed in the humidifier (s.a. techn. manual)



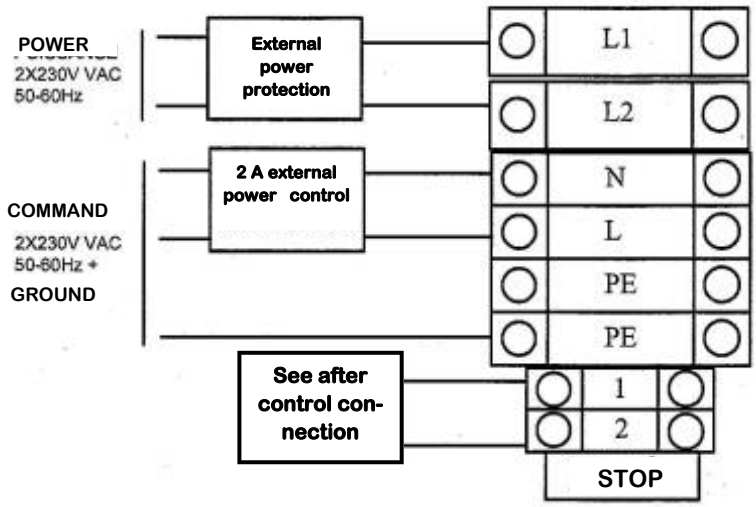
C) 3 phases without neutral
(3 x 400 V + 2 x 240 V)

The power and the control are supplied separately.

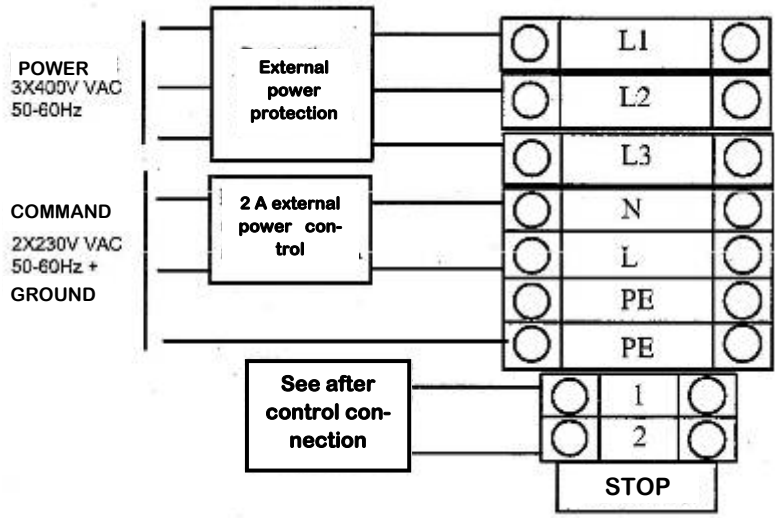
The command circuit must be shut in case a phase is missing



RTH-LC 3 to 5 in 230 V - 1 phase



RTH-LC 5/3 to 15 in 3 x 400V



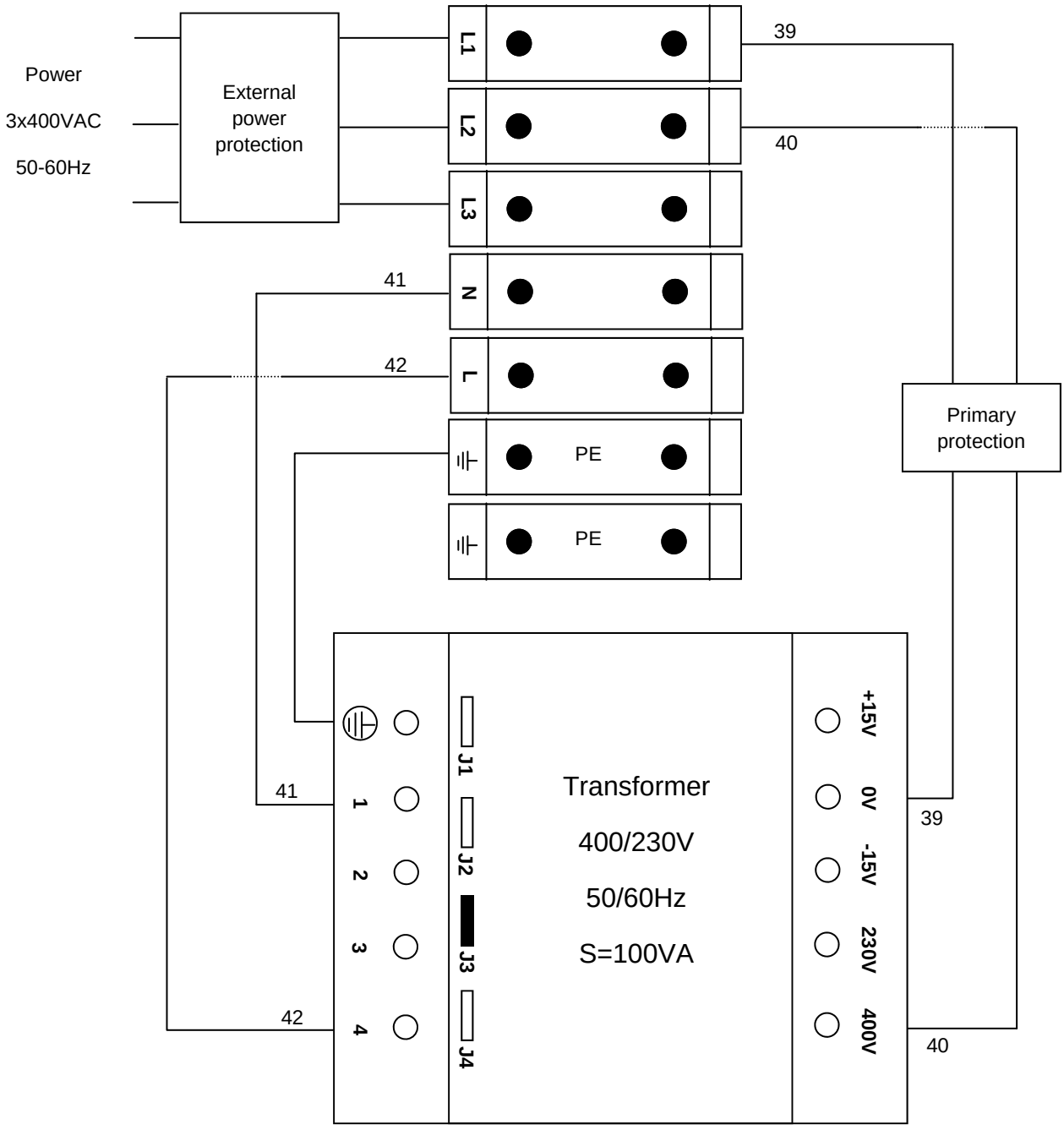
Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

(continued)

Humidifier without neutral fitted with a 400/230V transformer

The RTH-LC 5/3 to 15 humidifiers are electrically supplied in 3x400v + G + N. In case a neutral line is not available, this can however be easily substitued by the use of our optional transfomer preventing the installation of a specific neutral line.



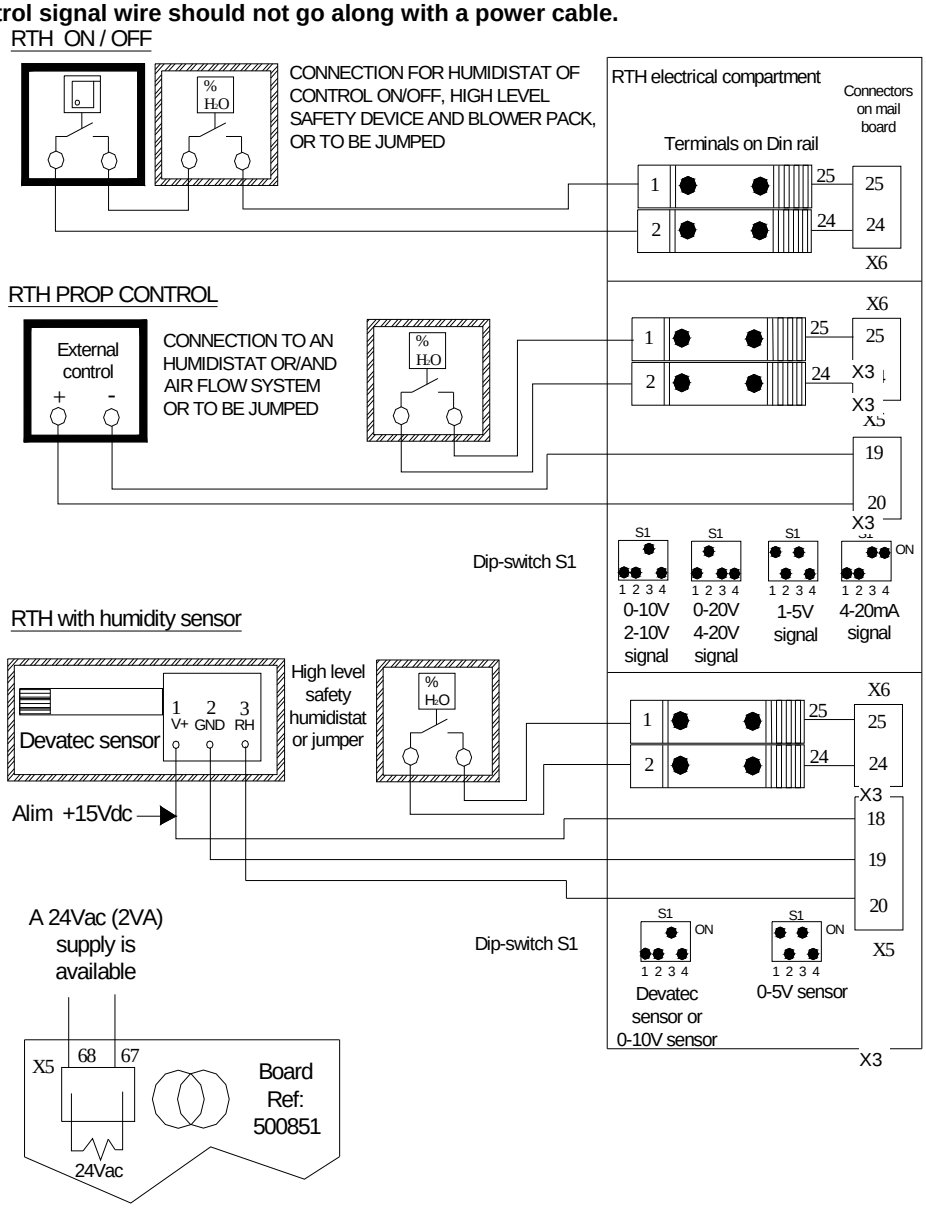
Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

ELECTROVAP RTH-LC

Control connection

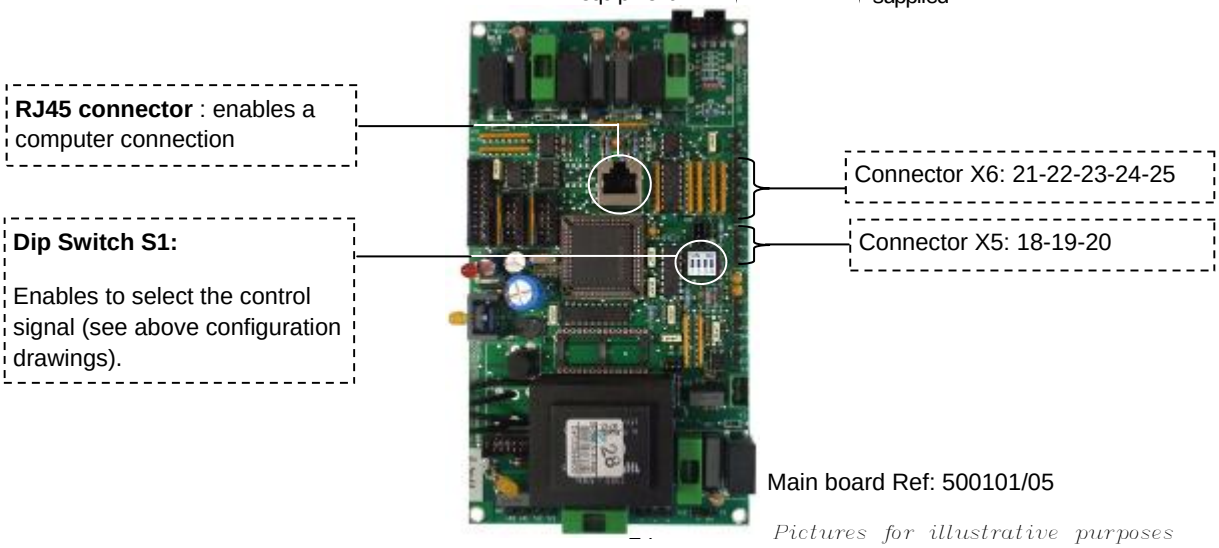
The wiring of the optional equipment described under must be made with 0.75 mm2 flexible cable. This control signal wire should not go along with a power cable.



RTH external wiring

Optional equipment

Equipment not supplied


RJ45 connector : enables a computer connection
Dip Switch S1:
Enables to select the control signal (see above configuration drawings).
Connector X6: 21-22-23-24-25
Connector X5: 18-19-20
Main board Ref: 500101/05

Pictures for illustrative purposes

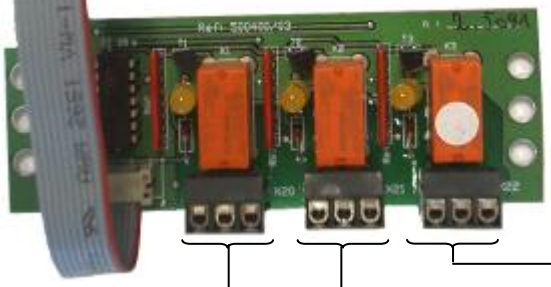
ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

(continued)

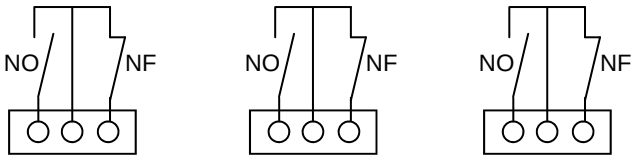
The wiring of the optional equipment described under must be made with 0.75 mm2 flexible cable.

REMOTE INFORMATION BOARD (OPTION)

Platine Réf: 500400/03



Contact can be modified in NO or NF by wiring as per the following schemes (ex: wiring on 30 & 31 = NO contact).



30 31 32
X20

33 34 35
X21

36 37 38
X22

X22 connector (36-37-38): Remote steam production dry contact.

X21 connector (33-34-35): Remote general fault dry contact

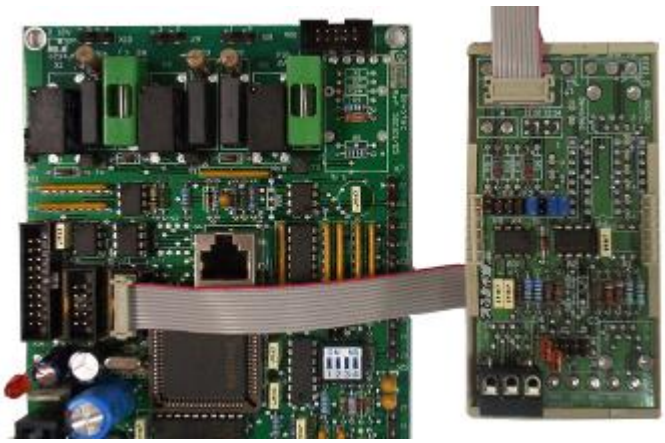
X20 connector (30-31-32): Remote cylinder maintenance dry contact

Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

(continued)

RS485 OR RS422 OR RS232 CIRCUIT BOARD (OPTION)



Main board Ref: 500800/01

SPECIFICATIONS

RS485 : 2 wires half duplex (+GND) Maximum length : 1200 m.
RS422 : 4 wires half duplex (+GND) On demand—Max length 1200

RS232 : 2 wires half duplex (+GND) On demand—Max length : 20 m.
Bias : 620 Ohms pull-up and pull-down (jumper selectable)

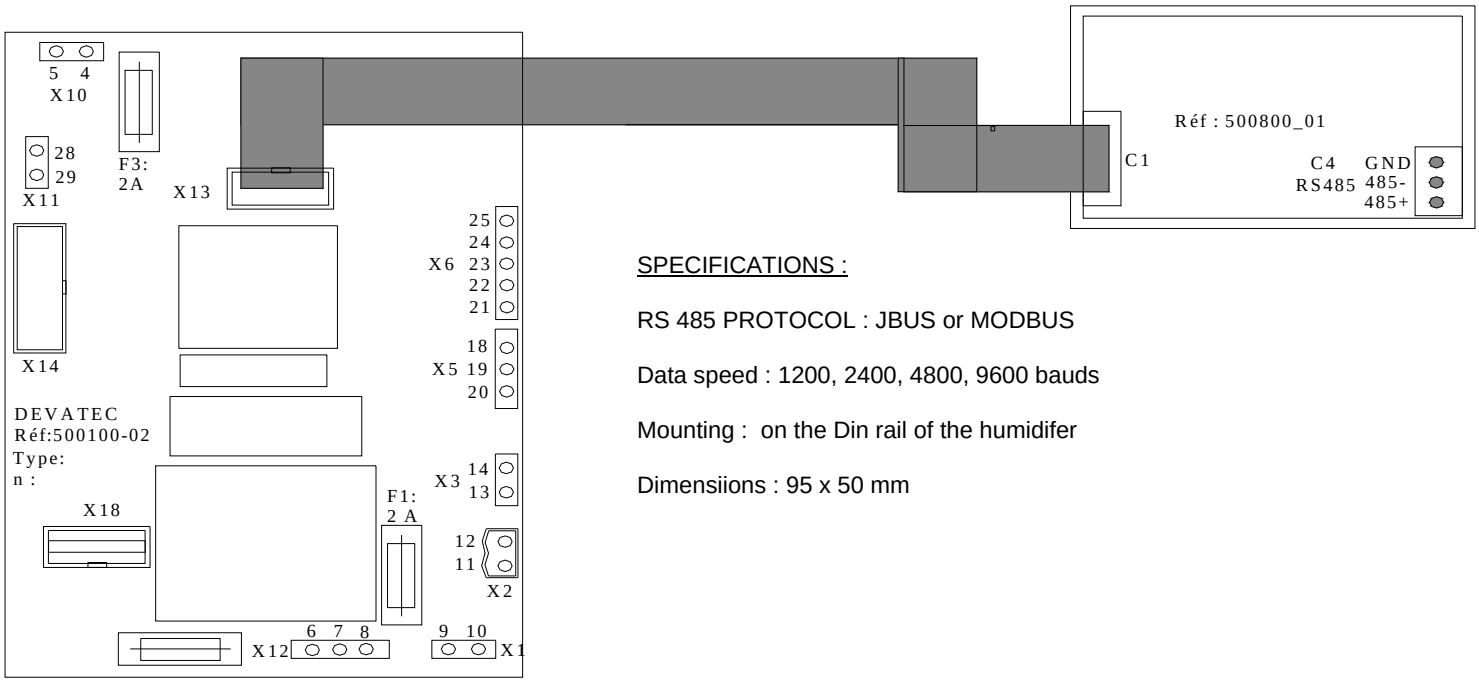
Termination : 120 Ohm (jumper selectable)

Protocol : JBUS or MODBUS (asynchronous of 8 bit data, no parity bit, 1 bit stop, CRC)
Speed data : 1200, 2400, 4800, 9600 bauds

Mounting : on the DIN rail of the humidifier.

Size : 95 x 50 mm

RS485 or RS422 or RS232 INTERFACE WIRING SCHEME



SPECIFICATIONS :

RS 485 PROTOCOL : JBUS or MODBUS

Data speed : 1200, 2400, 4800, 9600 bauds

Mounting : on the Din rail of the humidifer

Dimensiions : 95 x 50 mm

Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

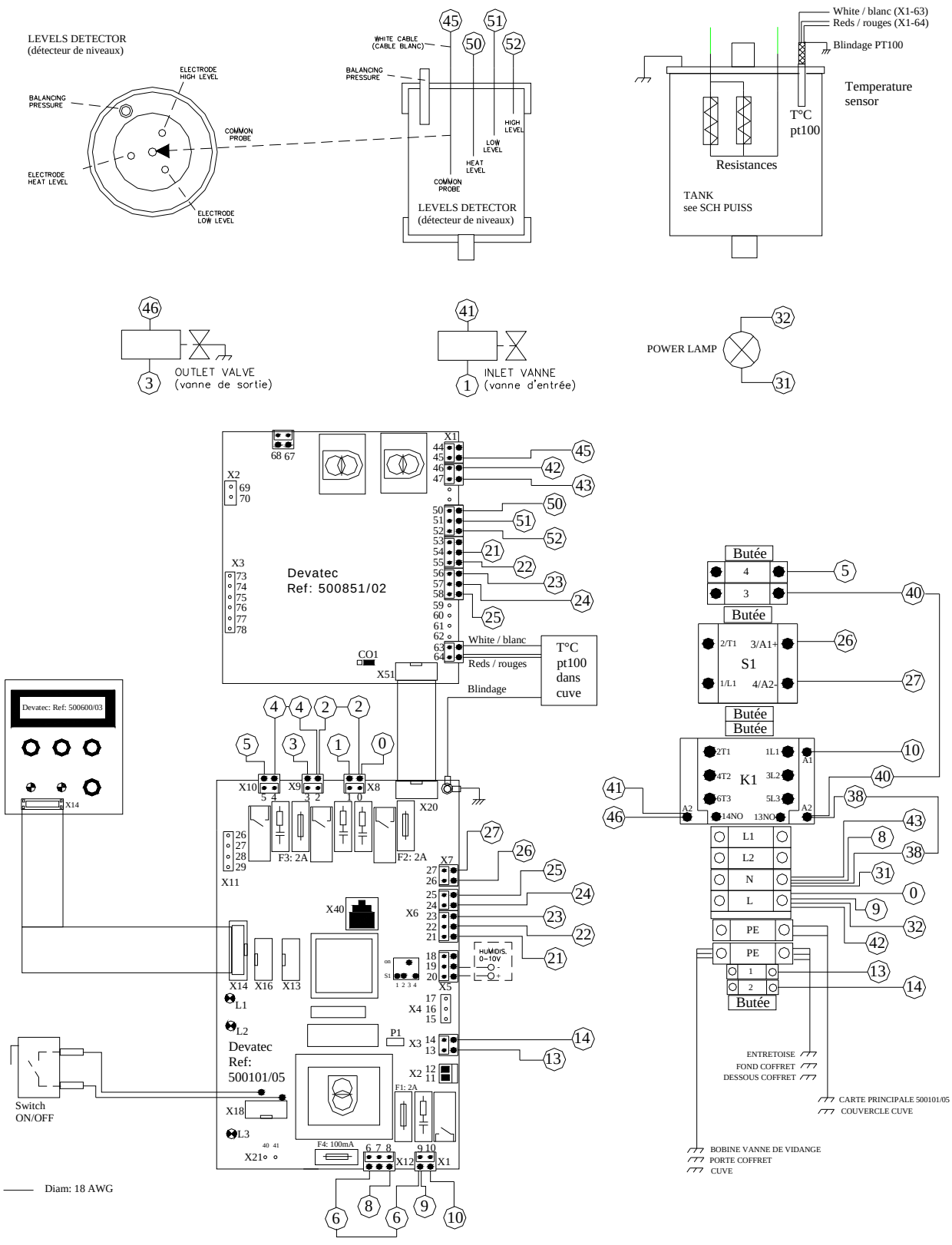
RS485 or RS422 or RS232 interface protocol :

Register Address	description	Value	Function number	Data Class	Address Data (Dec)
10001	Steam Production (Contactor)	1 = Production: ON / 0 = Production: OFF	Code 02, read only	b_har_RenvoiK3	0
10002	High limit (terminal block 1 and 2)	0 = opened / 1 = closed		b_rs2_Hygrostat	1
10003	Fill (Inlet Valve)	1 = Filling / 0 = no filling		b_har_Fill	2
10004	Drain (Drain Valve)	1 = draining / 0 = no draining		b_har_Drain	3
10005	Ventilation Pack (Blower)	1 = Blower: ON -- 0 = Blower: OFF		b_har_CVC	4
10006	Maintenance	1 is ON -- 0 is OFF		b_har_RenvoiK1	5
10007	General fault	1 is ON -- 0 is OFF		b_har_RenvoiK2	6
20001	Stop the humidifier via the BMS	1 = ON : Start requested / 0 = Off: Stop Unit	function 1 read only function 5 write	b_reg_OnOffBMS	0
30001	Run status	0: Idle 1: Steam Gen 2: End of season 3: Maintenance 4: Manual drain 5: Cooling 6:Failure P1 7:Failure P2 8:Failure P3 9: Failure P4 10:Failure P5 11:Failure P6 12:Failure P7 13: Failure P8 14:Failure P9 15:Failure P10	Code 04, read only	uc_reg_RunStatus	0
30002	Steam output	(Kg/hr)		ui_ihm_ProductVapeur	1
30003	Steam output	(lbs)		ui_ihm_ProductVapeur x 2,2	2
30004	Demand	(%)		uc_reg_Product	3
30005	Proportional Signal (analog input)	V, mA		ui_har_AffSignalHr	4
30006	Temperature tank	(°C)		uc_reg_AffTemp	5
30007	Temperature tank	(°F)		uc_reg_AffTemp	6
30008	Bed Life	(Hours) x 100		uc_ihm_TempsEntretien	7
30009	Run Time	(Hours)		ui_ihm_CptHeure	8
30010	Idle Time before drain	(Hours)		uc_ihm_CptArretProlonge	9
40001	"Maintenance interval"	(Hoursx100) mini = 1 and maxi = 200	function 3 read only : function 6 write	uc_ihm_FrequenceEntretien	0
40002	Idle Time (End of Season Time)	(Hour) mini = 6 and maxi = 168		uc_reg_TimeStopDrain	1
40003	Steam capacity limit	(%) mini = 20% and maxi = 100%		uc_ihm_DigitalProduct	2

Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

STEAM HUMIDIFIER RTH-LC 3 & 5 in 1x230V

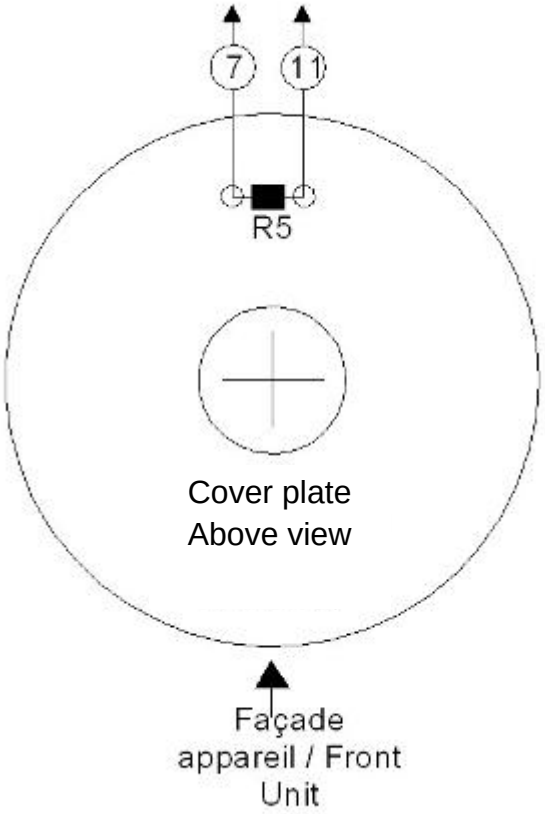


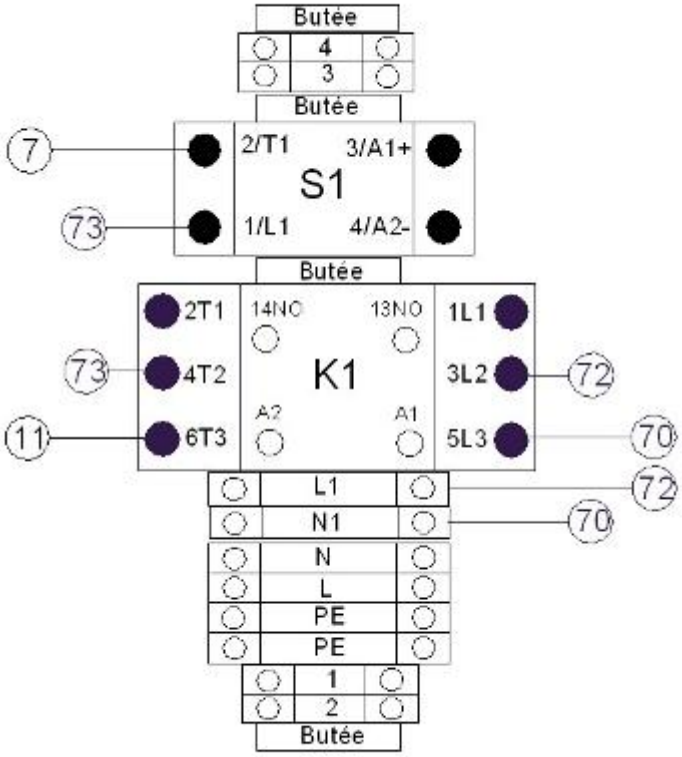
Mark	Intensity	Fuse function
F1	2A	Protection of the power contactor coil
F2	2A	Protection of the inlet valve coil
F3	2A	Protection of the drain valve coil
F4	100mA	Protection of the electronic boards

Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

RTH –LC 3 & 5 STEAM HUMIDIFIERS in 1 x 230V



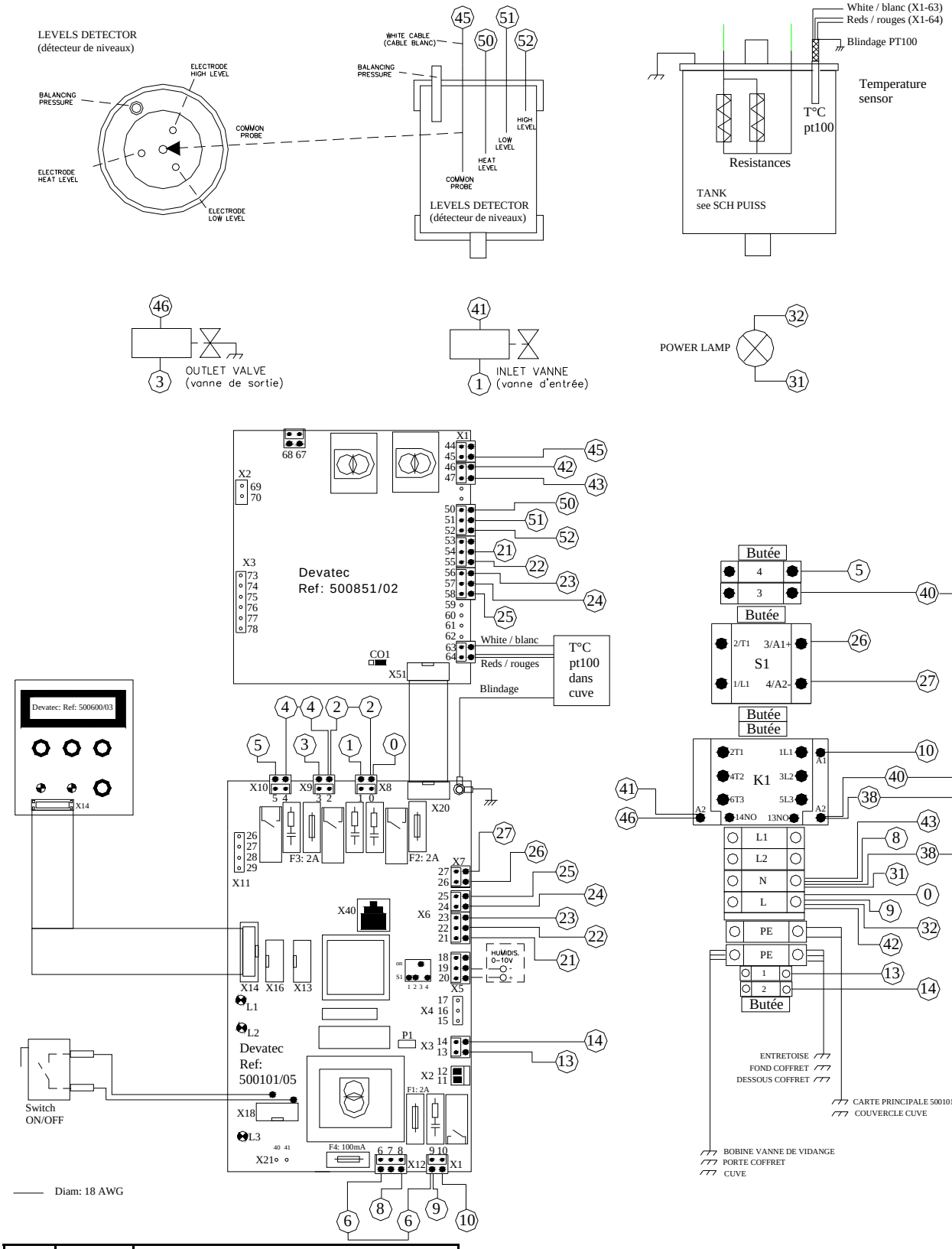


RTH	R5
3	1,9KW-230V
5	4,3KW-230V

Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

STEAM HUMIDIFIER RTH-LC 5/3 to15 in 3x400V

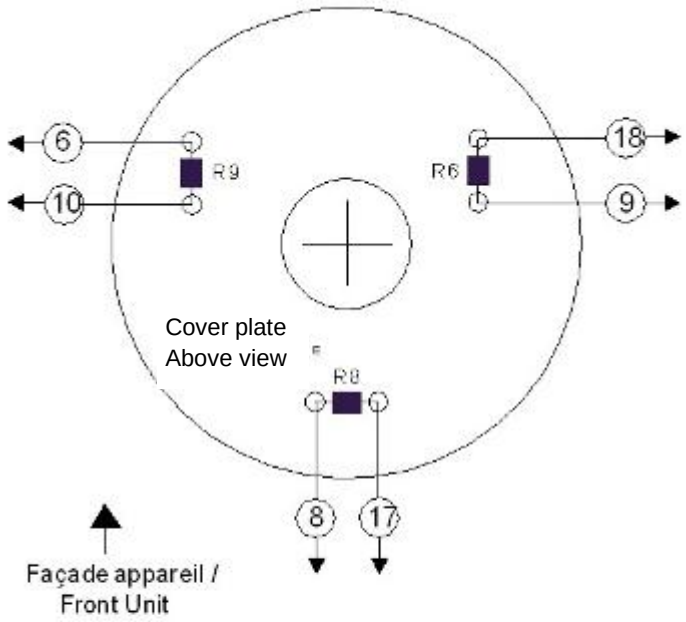


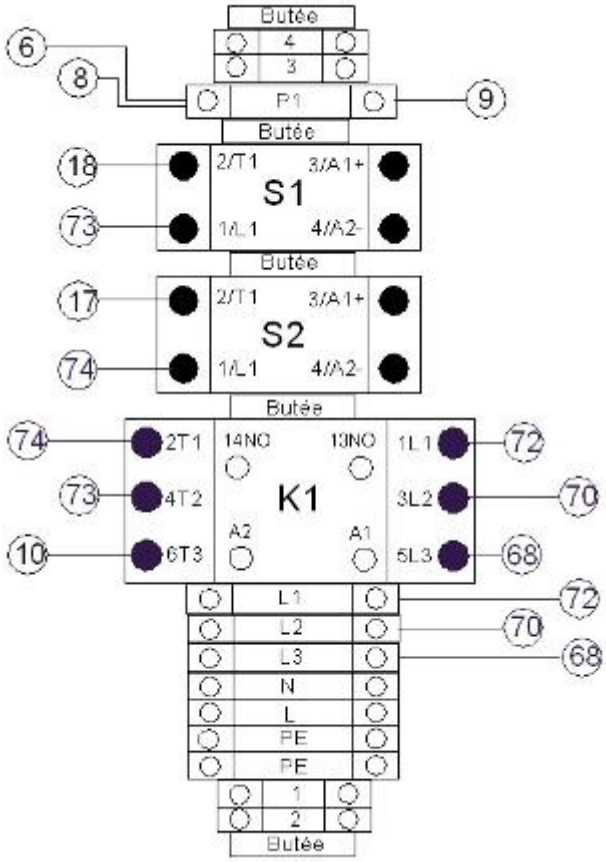
Mark	Intensity	Fuse function
F1	2A	Protection of the power contactor coil
F2	2A	Protection of the inlet valve coil
F3	2A	Protection of the drain valve coil
F4	100mA	Protection of the electronic boards

Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

RTH-LC 5/3 to 15 STEAM HUMIDIFIER in 3x400V



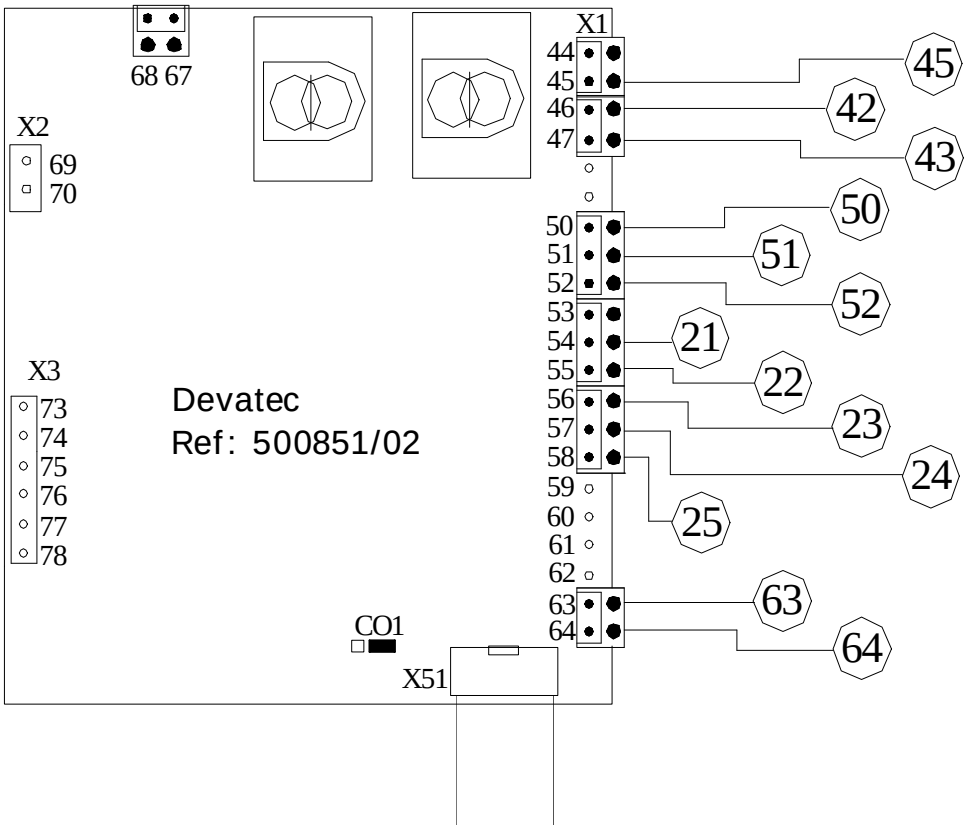


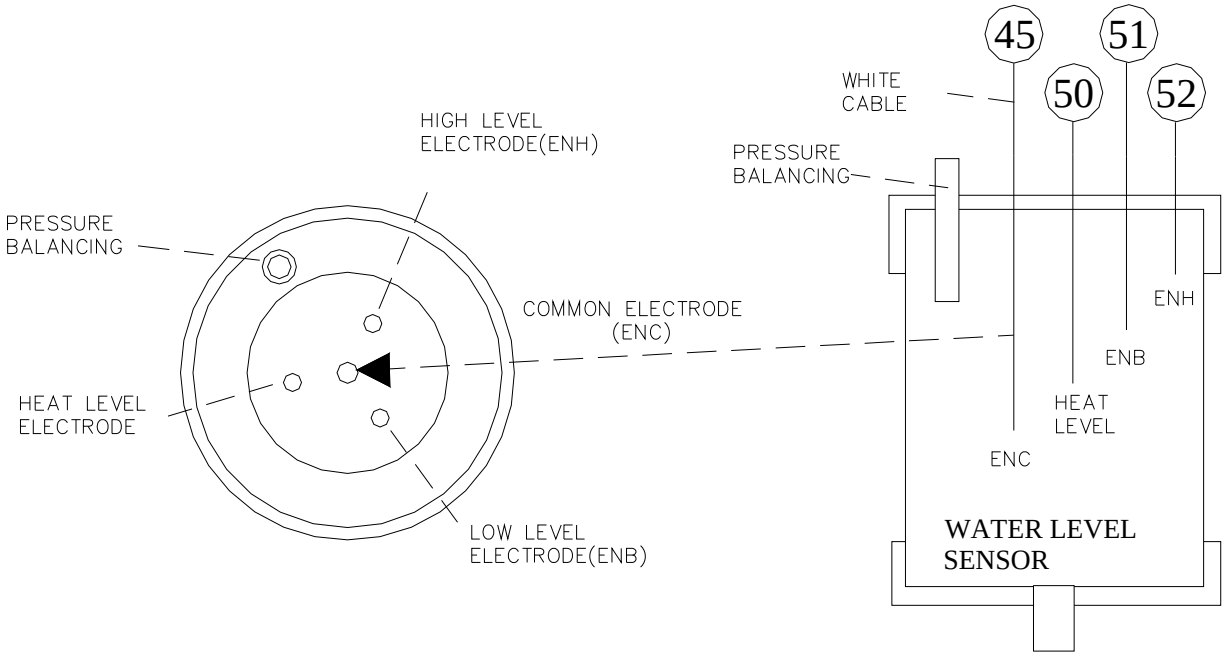
RTH	R6	R8	R9
5/3	1,9KW-277V	1,9KW-277V	1,9KW-277V
7	1,9KW-230V	1,9KW-230V	1,9KW-230V
10	4,3KW-277V	4,3KW-277V	4,3KW-277V
15	4,3KW-230V	4,3KW-230V	4,3KW-230V

Pictures for illustrative purposes

ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

WATER LEVEL MANAGEMENT BOARD

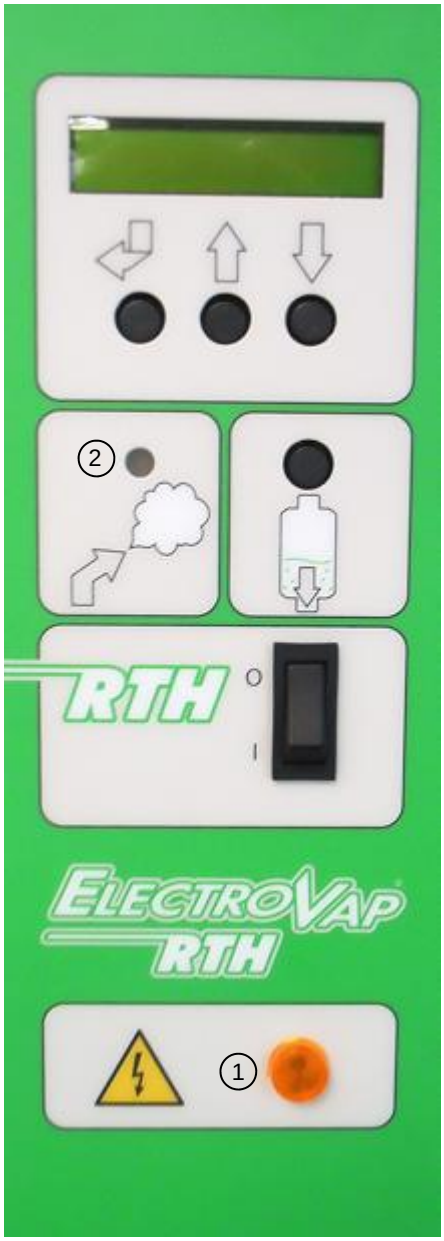




ALL WORKS CONCERNED WITH THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.

Pictures for illustrative purposes

Before putting your humidifier in operation, please make sure that your installation be in conformity with the manufacturer's technical specifications.



- Open the water valve of the main water line.
- Switch on the main power supply contactors (voltage and command).
- The power-on light (1) must be illuminated.
- Switch on I the I/O (on/off) rocker switch.
- The display will default to show the rate of steam produced. You are in the user information menu.

DISPLAY OPERATION :

1 Pressing the select button ⏎ repeatedly will rotate between the three main pages.

2 Enter the derised menu by pressing the up ⇧ or ⇩ down button.

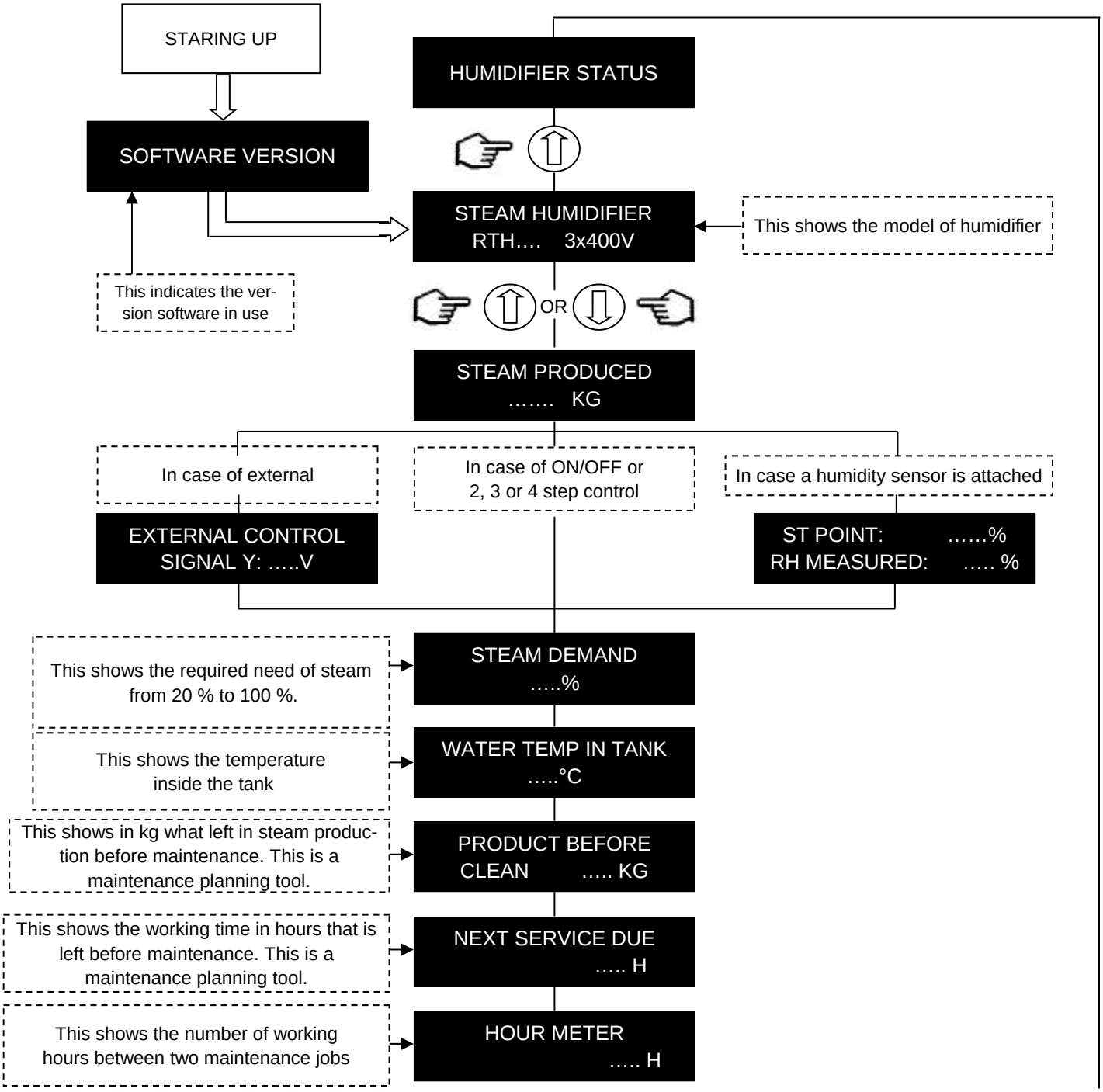
- As soon as the humidifier is prompted by the regulator, the humidity (2) sensor or the humidistat, the contactor of the DIN rail turns on and the power heating is on (the steam production LED is illuminated)

- When the humidifier is switched on, the inlet valve opens and the boiler is flushed with water. The heating elements then heat the water up and after about 10 minutes (the heating time depends on the model of humidifier and the water conductivity), the humidifier steams up.

Pictures for illustrative purposes

ATTENTION

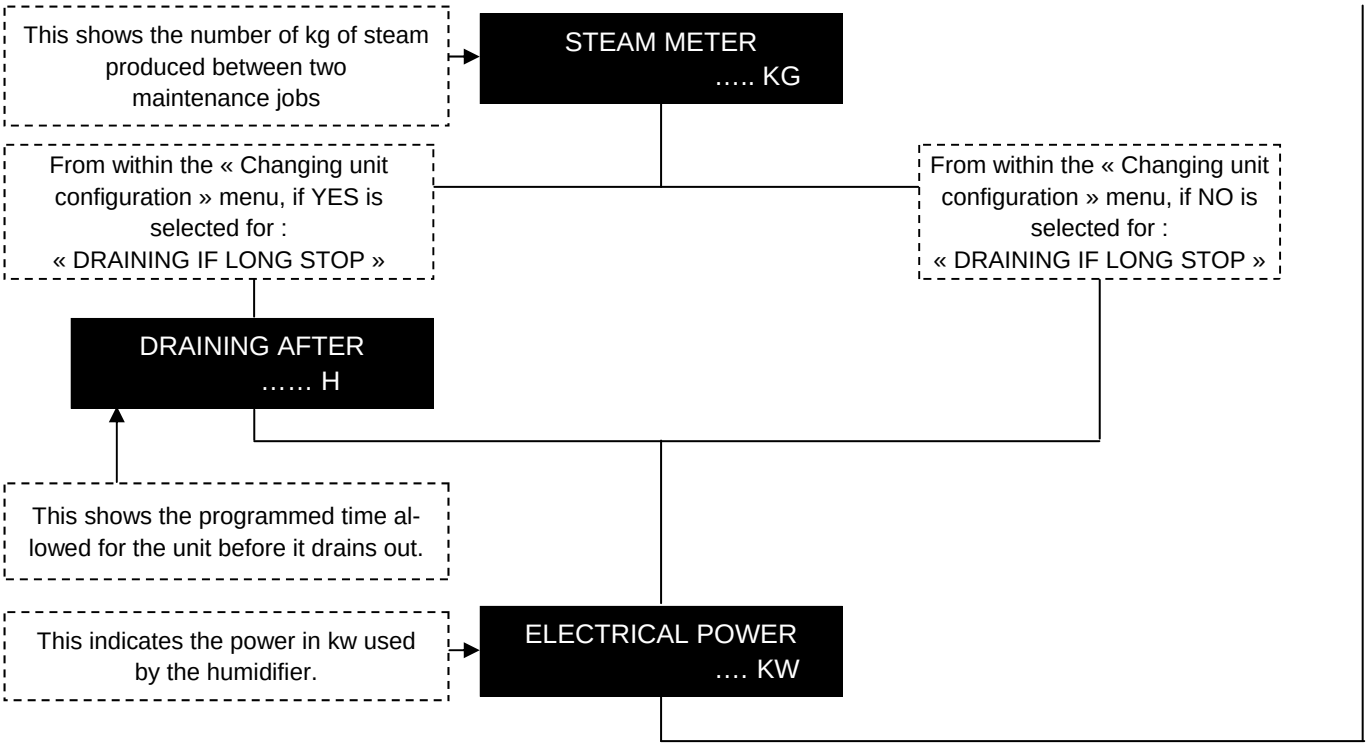
- A press on button 1 will allow you to shift to sub-menu for changing configuration parameters.
- Then scroll display using the up (2) or down (3) keys.
- The selected parameter will flash and press return key (1) for recording.


STARING UP
SOFTWARE VERSION
This indicates the version software in use
HUMIDIFIER STATUS
STEAM HUMIDIFIER RTH…. 3x400V
This shows the model of humidifier
OR
STEAM PRODUCED ……. KG
In case of external
EXTERNAL CONTROL SIGNAL Y: …..V
In case of ON/OFF or 2, 3 or 4 step control
In case a humidity sensor is attached
ST POINT: ……%
RH MEASURED: ….. %
This shows the required need of steam from 20 % to 100 %.
STEAM DEMAND …..%
This shows the temperature inside the tank
WATER TEMP IN TANK …..°C
This shows in kg what left in steam production before maintenance. This is a maintenance planning tool.
PRODUCT BEFORE CLEAN ….. KG
This shows the working time in hours that is left before maintenance. This is a maintenance planning tool.
NEXT SERVICE DUE ….. H
This shows the number of working hours between two maintenance jobs
HOUR METER ….. H

Pictures for illustrative purposes

(continued)

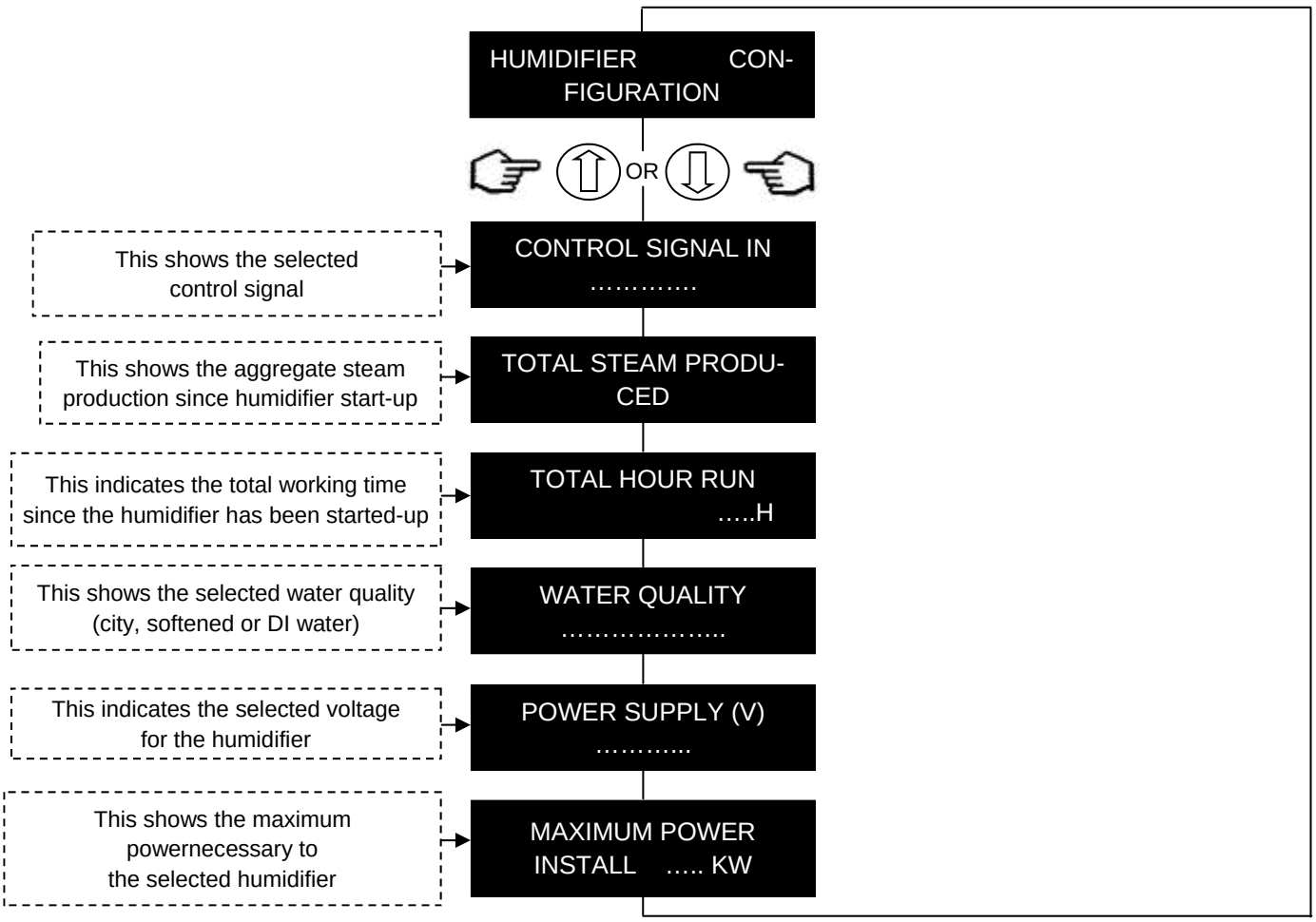
- Press the ⏎ key for changing menu at any time.


This shows the number of kg of steam produced between two maintenance jobs
STEAM METER
….. KG
From within the « Changing unit configuration » menu, if YES is selected for :
« DRAINING IF LONG STOP »
From within the « Changing unit configuration » menu, if NO is selected for :
« DRAINING IF LONG STOP »
DRAINING AFTER
…… H
This shows the programmed time allowed for the unit before it drains out.
This indicates the power in kw used by the humidifier.
ELECTRICAL POWER
…. KW

Pictures for illustrative purposes

ATTENTION

- A press on button 1 will allow you to shift to sub-menu for changing configuration parameters.
- Then scroll display using the up (2) or down (3) keys.
- The selected parameter will flash and press return key (1) for recording.


HUMIDIFIER CON-FIGURATION
OR
CONTROL SIGNAL IN ……
This shows the selected control signal
TOTAL STEAM PRODU-CED
This shows the aggregate steam production since humidifier start-up
TOTAL HOUR RUN …..H
This indicates the total working time since the humidifier has been started-up
WATER QUALITY ……..
This shows the selected water quality (city, softened or DI water)
POWER SUPPLY (V) ……..
This indicates the selected voltage for the humidifier
MAXIMUM POWER INSTALL ….. KW
This shows the maximum powernecessary to the selected humidifier

Pictures for illustrative purposes

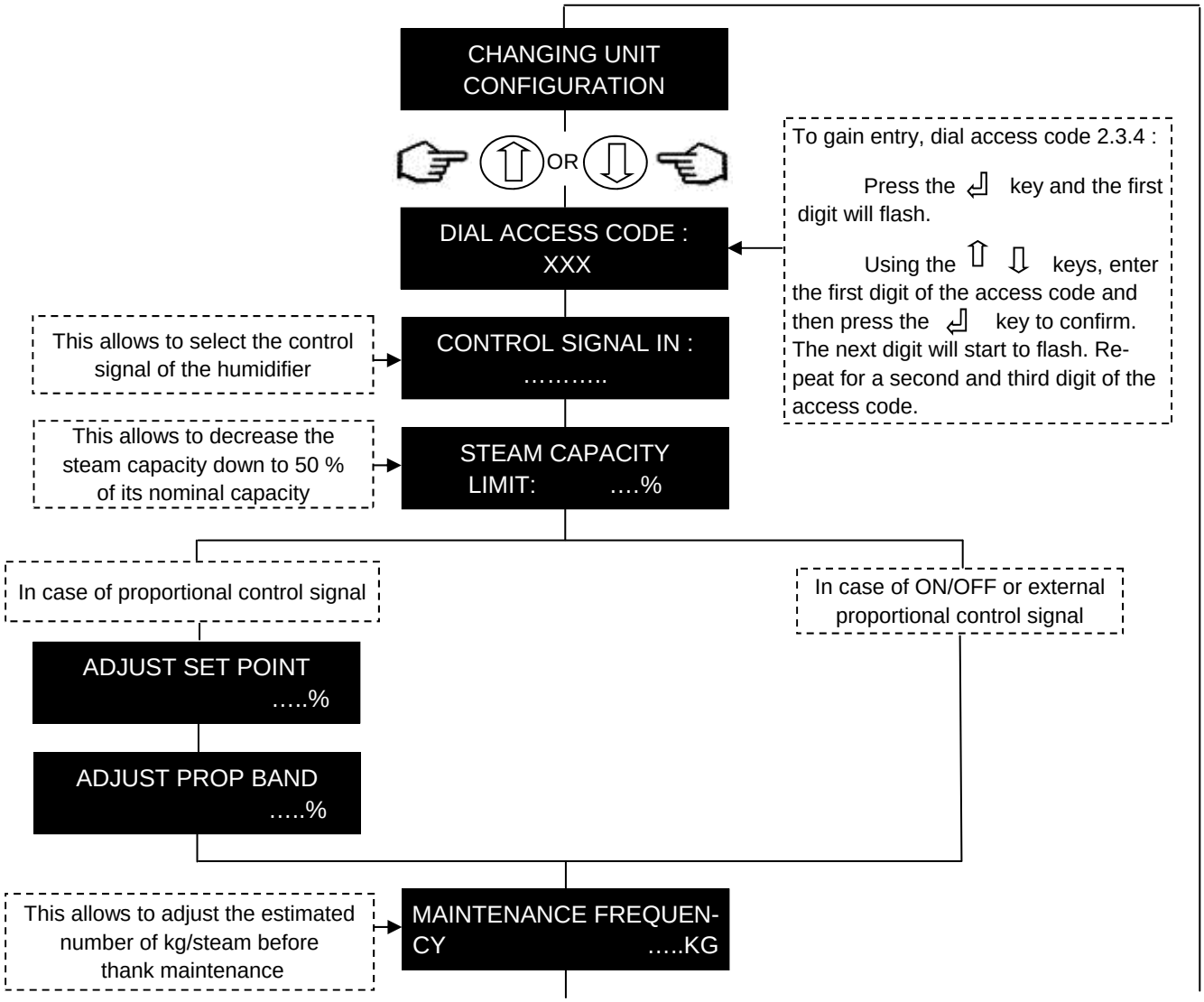
How to change the operating parameters /

Example:

STEAM CAPACITY
LIMIT : ….%.

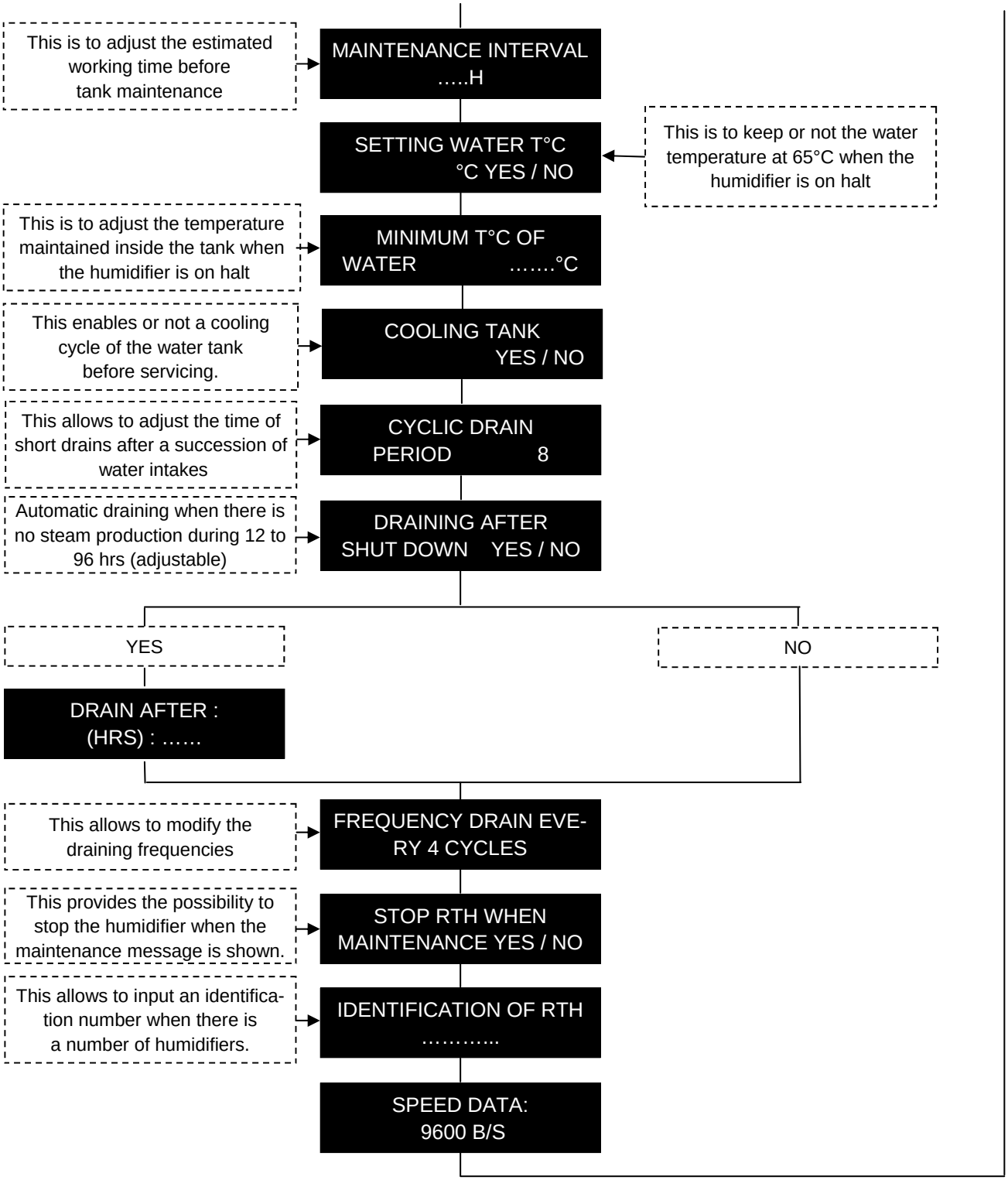
- Scroll menu to get this message, press the ↵ key and the value will flash.
- Using the ⇧ OR ⇩ keys, increase or decrease the value.
- Once the desired value is reached, press the ↵ key to enter the data.
- The display will read :

RECORDED
PARAMETER


CHANGING UNIT CONFIGURATION
OR
DIAL ACCESS CODE : XXX
To gain entry, dial access code 2.3.4 :
Press the ↵ key and the first digit will flash.
Using the ⇧ ⇩ keys, enter the first digit of the access code and then press the ↵ key to confirm. The next digit will start to flash. Repeat for a second and third digit of the access code.
This allows to select the control signal of the humidifier
CONTROL SIGNAL IN : …….
This allows to decrease the steam capacity down to 50 % of its nominal capacity
STEAM CAPACITY LIMIT: ….%
In case of proportional control signal
In case of ON/OFF or external proportional control signal
ADJUST SET POINT …..%
ADJUST PROP BAND …..%
This allows to adjust the estimated number of kg/steam before thank maintenance
MAINTENANCE FREQUENCY …..KG

Pictures for illustrative purposes

(continued)


This is to adjust the estimated working time before tank maintenance
MAINTENANCE INTERVAL .....H
SETTING WATER T°C °C YES / NO
This is to keep or not the water temperature at 65°C when the humidifier is on halt
This is to adjust the temperature maintained inside the tank when the humidifier is on halt
MINIMUM T°C OF WATER .....°C
This enables or not a cooling cycle of the water tank before servicing.
COOLING TANK YES / NO
This allows to adjust the time of short drains after a succession of water intakes
CYCLIC DRAIN PERIOD 8
Automatic draining when there is no steam production during 12 to 96 hrs (adjustable)
DRAINING AFTER SHUT DOWN YES / NO
YES
NO
DRAIN AFTER : (HRS) : .....
This allows to modify the draining frequencies
FREQUENCY DRAIN EVE-RY 4 CYCLES
This provides the possibility to stop the humidifier when the maintenance message is shown.
STOP RTH WHEN MAINTENANCE YES / NO
This allows to input an identifica-tion number when there is a number of humidifiers.
IDENTIFICATION OF RTH .....
SPEED DATA: 9600 B/S

Pictures for illustrative purposes

Alerts

What you should do when :

NO WATER IN THE WATER LEVEL DETECTOR

Humidifier status : the unit is on halt

- Switch the humidifier off.
- Control the internal water piping.
- Control the water level detection system.

Please revert to the « maintenance » section of this manual

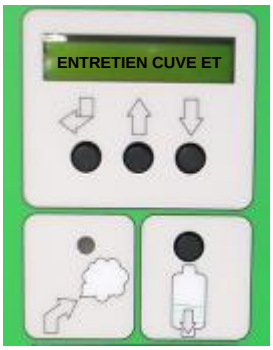
Maintenance warning

What you should do when :

CLEANING : OUTLET VALVE + TANK

Humidifier status : the unit is on halt

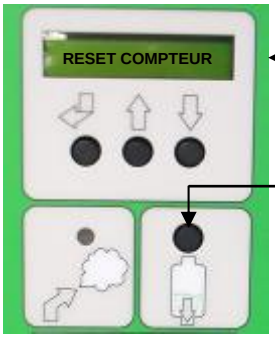
- Switch the humidifier off.
- Please revert to the « maintenance » section of this manual and apply the maintenance procedure.
- Switch the humidifier on again.



RTH humidifier with software version V05_08 or above :

- Press first on then press on

- The humidifier can work again and the maintenance timer can be reset for the selected value (s.a. page 28-29).



The display reads :

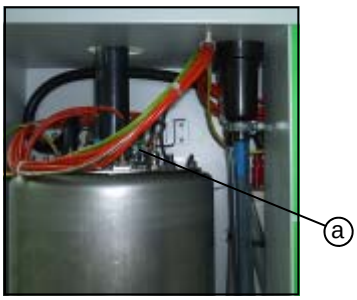
Press this push button to go back to « STEAM PRODUCED » displayed message.

Pictures for illustrative purposes

Picture n°1

- Drain the tank out by pressing the manual drain button (s.a. picture n° 1). Wait for complete draining and allow the tank to cool down (if this feature has been enabled).

Picture n°2



- Cut off the power supply at the power switch-board and switch off the RTH humidifier.

- Screw off the front door, lift it a little and take it away. Remove the black steam hose from the steam tank (s.a. picture n°2) and draw it out the humidifier.

Picture n°3

- Unscrew all the screws of the boiler top with a 10 mm wrench (s.a. picture n°3).

Picture n°4

- Lift the boiler up to get it free from its base (s.a. picture n° 4).

Picture n°5

Pictures for illustrative purposes

(continued)

Picture n°6

- Put the heating element assembly on the top of the humidifier (s.a. picture n° 6).

- Put a container or the optional flexible calcius collecting bag on ground and empty the boiler contents in it (s.a. picture n° 7).

Picture n°7

- **Take care : the tank gasket should be changed whenever the boiler is maintained (s.a. picture n° 8). Retigthen all the collar clamps.**

Do not scratch harshly, hit or use corrosive liquids on the heating elements.

Picture n°8

- Uncap the water level tank and clean the 4 electrodes (s.a. picture n° 9).

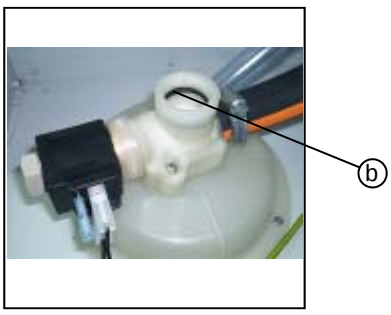
Do not use any solvent to clean the water level tank nor special glues if the tank needs being attended but use teflon. Use a scraper on sensor electrodes if needed.

Picture n°9

- Set back the high water level tank cap. Reassemble the boiler cover assembly and the boiler in the same position.

- Make sure there is still the O ring in the drain valve body before putting back the steam boiler (s.a. picture n° 10-b).

Picture n°10



Tighten up all the screws of the boiler top and reconnect the steam hose.

Pictures for illustrative purposes

DRAIN VALVE MAINTENANCE

The drain valve should be maintained whenever the steam cylinder is maintained or changed.

Once the steam cylinder has been pulled out (please refer to the « cleaning of the steam cylinder » page), disconnect the drain valve supply wires.

Unscrew the solenoid retaining nut and remove the washer. Put them on the cylinder compartment tray.

Remove the coil from the valve stem.

Unscrew and remove the valve stem and the filling hose from the valve body.

Important : Apply some soap on the O-ring and the cylinder draining outlet

Remove the « O » ring and the drain valve collar. Remove any pieces of calcius, rinse the steam and the body with fresh water.

Assemble in reverse order.

Once the drain valve has been cleaned up, put the boiler back in its compartment in proceeding this way : set the maintaining clip on the steam cylinder outlet, engage the drain outlet into the drain valve and push the cylinder downward. Locate the steam hose and fasten the clamp.

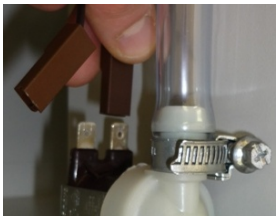
Ensure that all the clamps are properly tightened whenever the humidifier is maintained.

Pictures for illustrative purposes

INLET VALVE MAINTENANCE

The inlet valve should be maintained every 6 months as a minimum and after 50 hours operation.

Isolate the water supply and remove the water supply hose from the valve.



Disconnect the electrical wires from the coil.

Untighten the collar clamp and remove the water feed hose.

Unscrew the black nut ① and lay it on the cylinder compartment tray.

Take the valve out and remove the basket filter from the base of the valve with a pair of long nose pliers. Pull the coil out with a flat screw driver.

Wash the basket filter under clean water to remove any dirt and debris.

Replace whole valve if cleaning is not practical or replace coil if necessary.

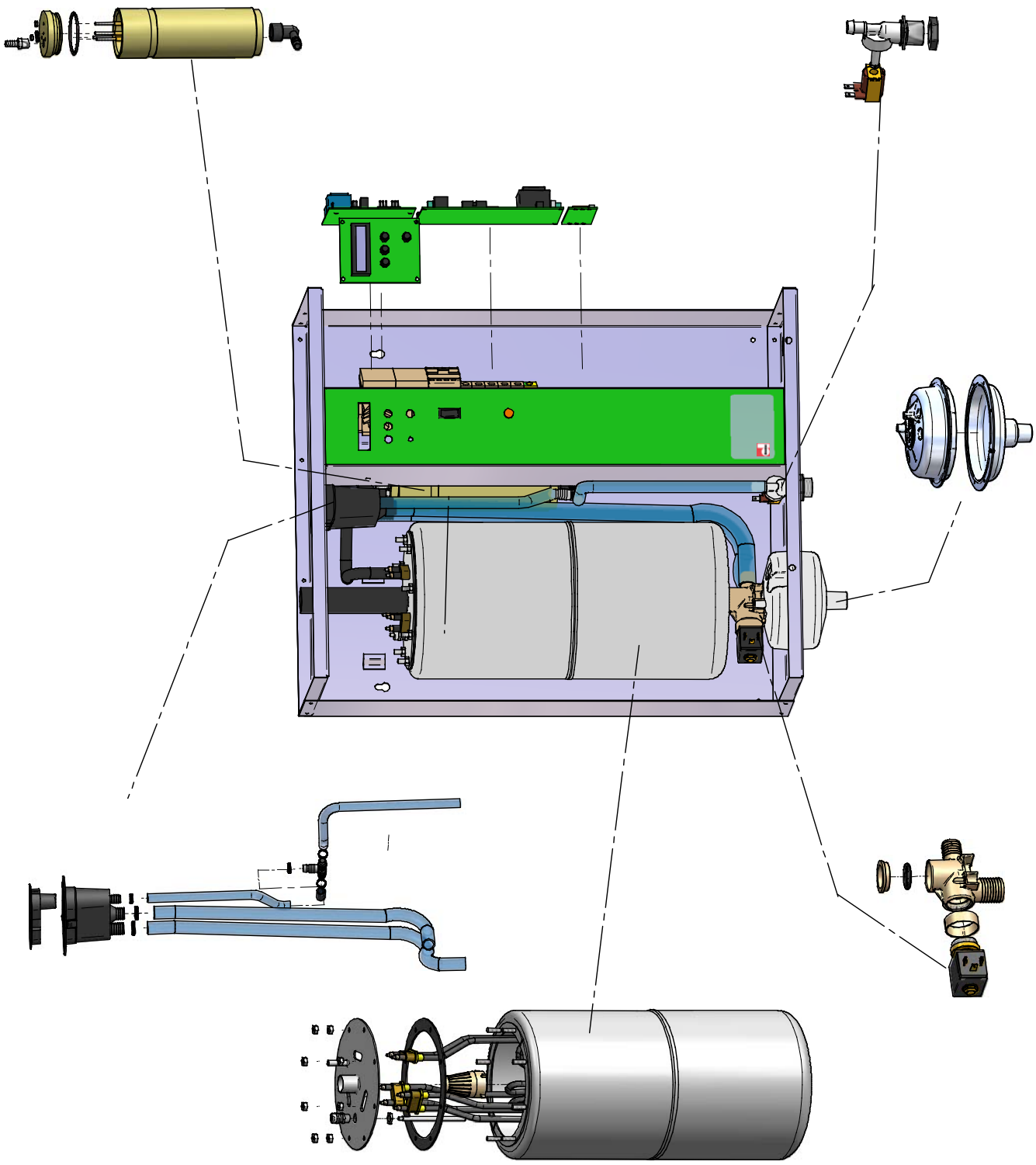
Assemble in reverse order taking care to replace collar clamp if necessary.

Ensure that everything is correctly assembled and switch the humidifier on.

Ensure that all the clamps are properly tightened whenever the humidifier is maintained.

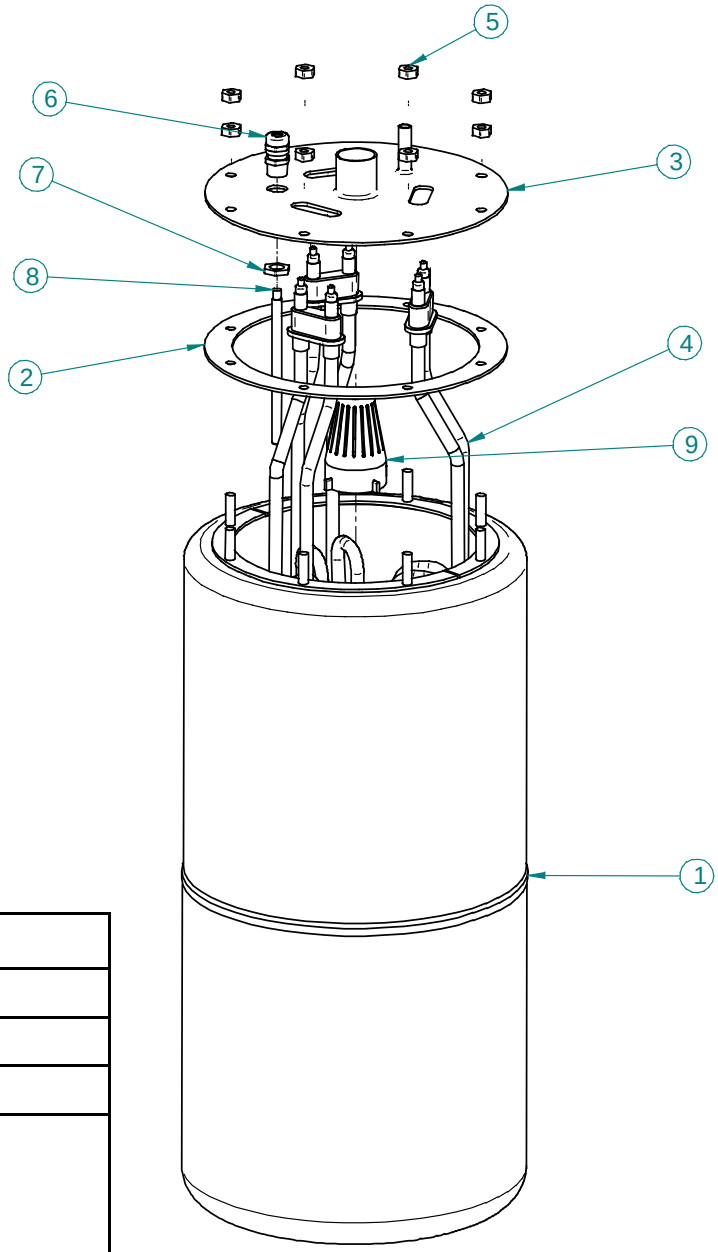
Pictures for illustrative purposes

OVERVIEW



Pictures for illustrative purposes

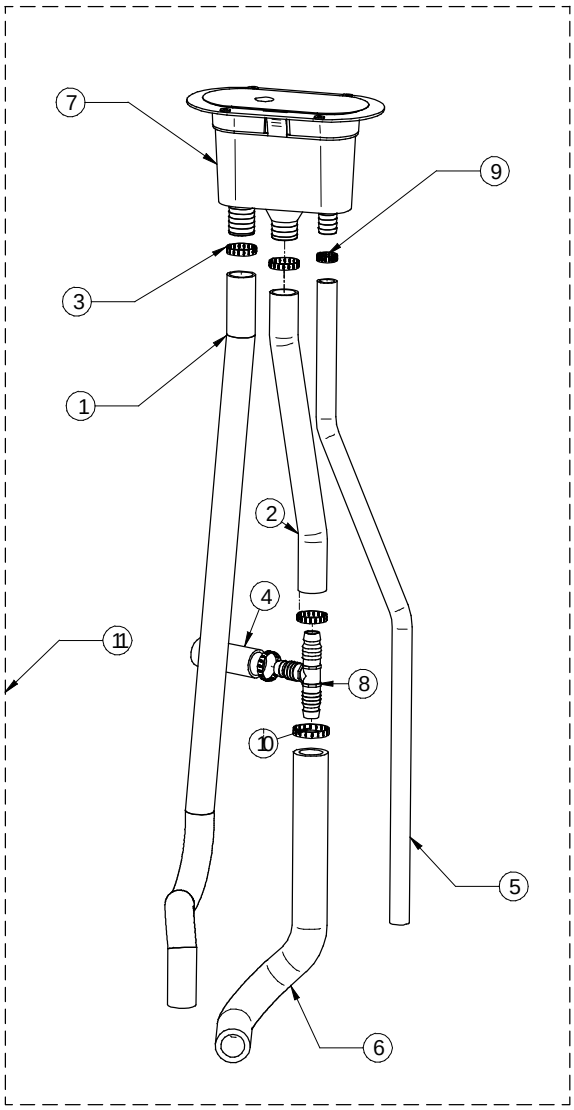
STAINLESS STEEL BOILER



Rep	Code	Description
1		Stainless steel cylinder
2	930553	Cylinder gasket
3		Cylinder top
4	930500	Heating element 1,9KW (230V)
	930547	Heating element 1,9KW (277V)
	930503	Heating element 4,3KW (230V)
	930548	Heating element 4,3KW (277V)
5		Watertight nut M6
6	930505	Metal stuffing box
7		Stuffing box screw
8	930504	PT100 temperature sensor
9		PPH inner filter

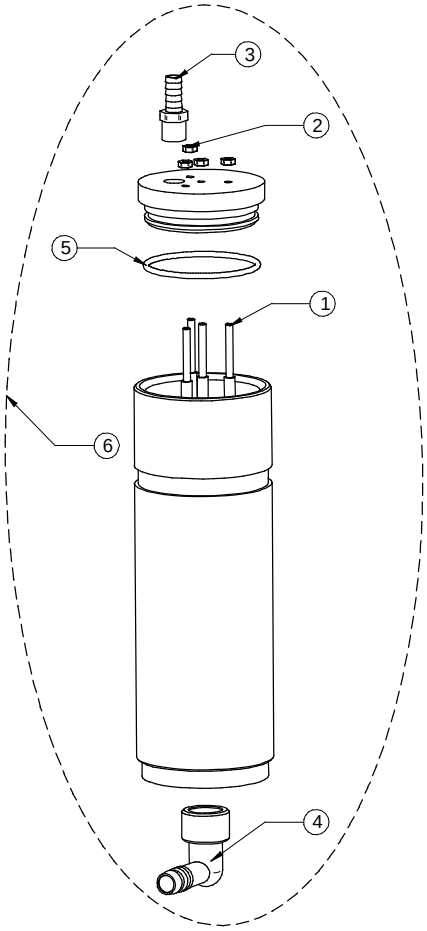
Pictures for illustrative purposes

Filling cup



Rep	Code	Description
1	930137	Water hose Ø18x22mm
2	930137	Water hose Ø18x22mm
3	930082	Ring clamp Ø16x27mm
4	930137	Water hose Ø18x22mm
5	93135	Water feed hose Ø12x16mm
6	930137	Overflow hose Ø18x22mm
7	930231	Filling cup assy
8	930506	Black PVC fluted tee Ø20x20x20mm
9	930081	Ring clamp Ø12x22mm
10	930082	Ring clamp Ø16x27mm
11	930554	RTH-LC filling cup with hoses

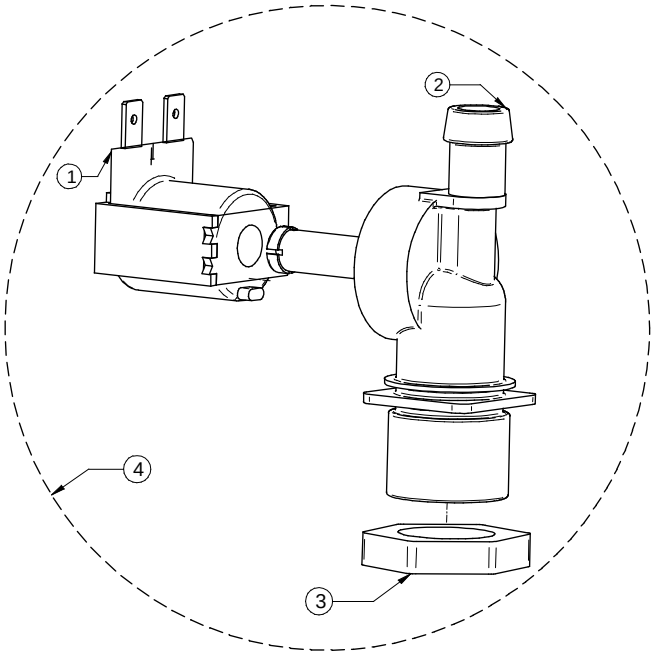
Water level detection tank



Rep	Code	Description
1	930521	Water level sensor (set of 4)
2		Stainless steel nut Ø4mm
3		Fluted chromium plated tip 1/4" G - Ø8mm
5	930523	Black O ring SIL70 (bag of 2)
6	930522	Water level assy

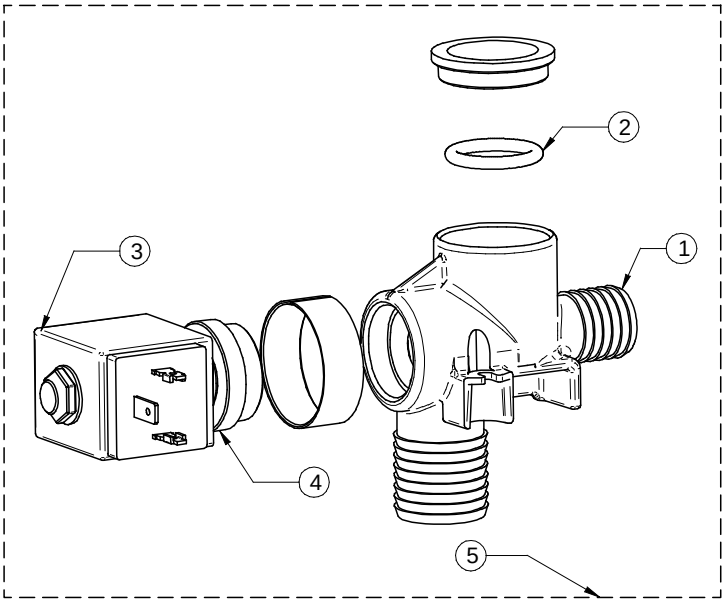
Pictures for illustrative purposes

Water inlet valve



Rep	Code	Description
1	930160	Inlet valve solenoid coil
2		Inlet valve body N2
3	930224	Screw 3/4"
4	930151	Complete inlet valve

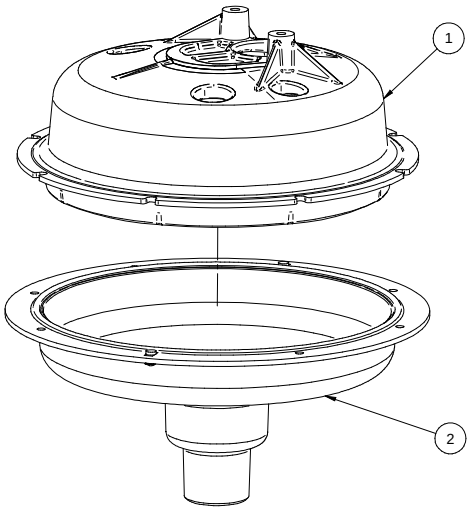
Water drain valve



Rep	Code	Description
1	930307	Drain valve body
2	930189	Drain valve O ring (bag of 10)
3	930161	Drain valve solenoid coil
4	930220	Insert (+ drain valve coil)
5	930153	Complete drain valve

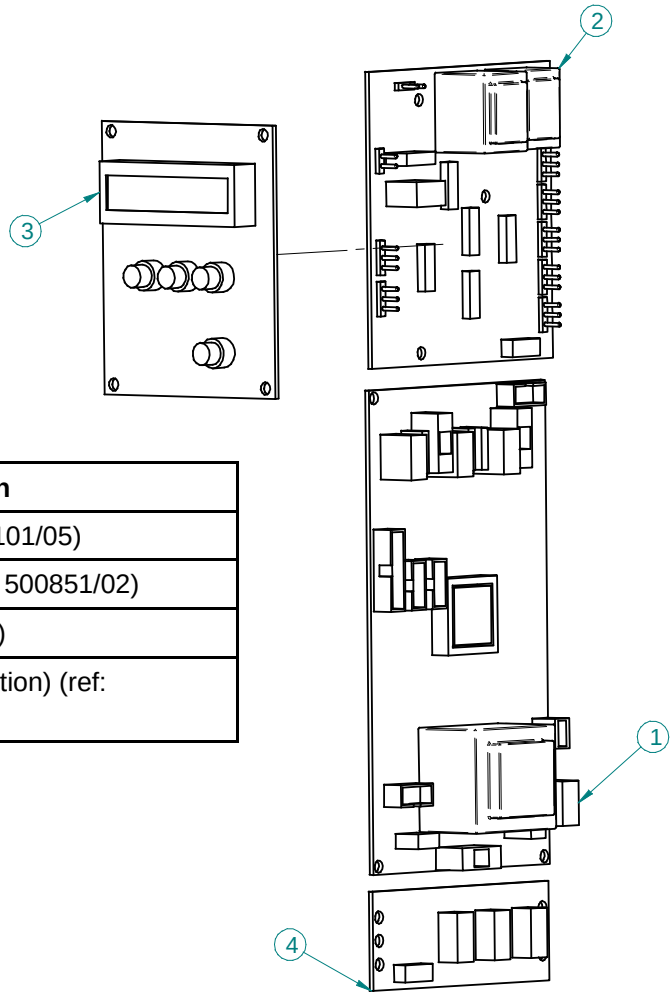
Pictures for illustrative purposes

Drain cups



Rep	Code	Description
1+2	930359	RTH-LC upper & lower drain cups

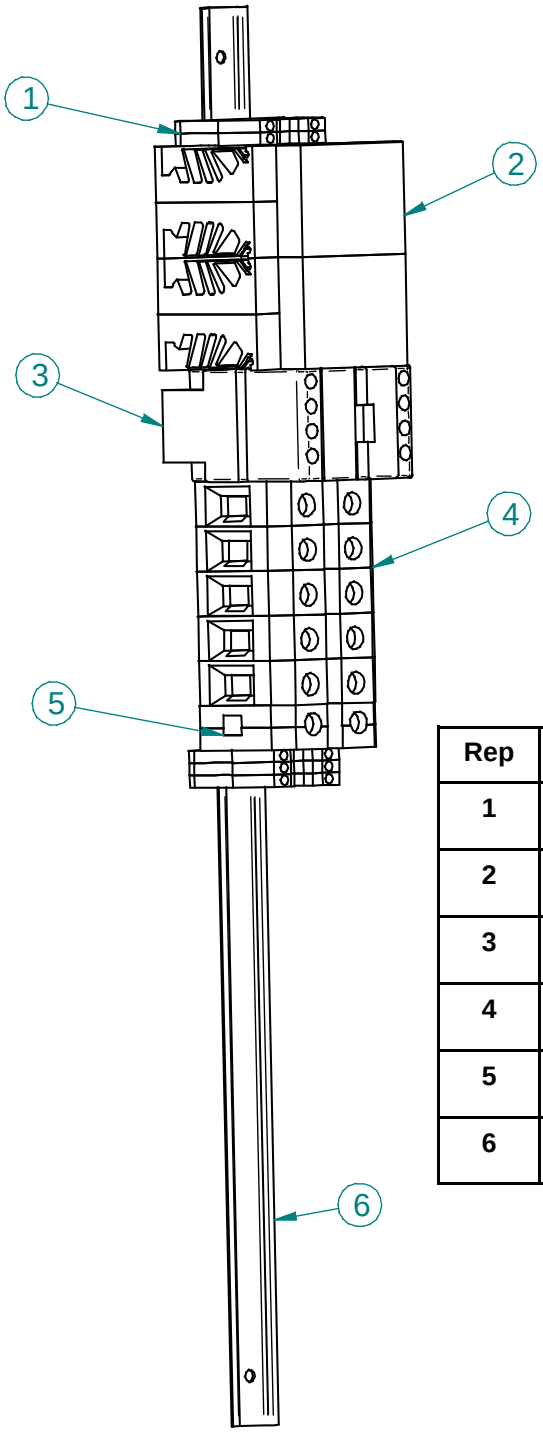
Electronic circuitry



Rep	Code	Description
1	930532	RTH-LC main board (ref: 500101/05)
2	930530	Water level control board (ref: 500851/02)
3	930101	Display board (ref: 500600/03)
4	930106	Remote information board (option) (ref: 500400/03)

Pictures for illustrative purposes

Electrical Din rail



Rep	Code	Description
1		Electrical terminal JSAK 2,5 EN
2	930549	Static relay + heatsink RTH-LC
3	930093	Power contator LC1-D32
4		Electrical terminal JSAK 16 EN
5		Earth terminal JEK 35/35
6		DIN rail

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